BETTER FRUIT

VOLUME IX JULY, 1914 NUMBER 1

THE MOST POPULAR OF ALL PEARS FOR EATING FRESH AND CANNING IS THE BARTLETT. IT IS GROWN MORE EXTENSIVELY THAN ANY OTHER VARIETY AND IS PRODUCED IN A LARGE COMMERCIAL WAY IN MANY SECTIONS OF THE NORTHWEST—SOUTHERN OREGON, WILLAMETTE VALLEY, YAKIMA VALLEY, HOOD RIVER, AND IDAHO. THIS SCENE WAS TAKEN AT SHERIDAN, OREGON, WHERE BARTLETT PEARS ARE BEING SET QUITE EXTENSIVELY. THE SHIPPING SEASON WILL COMMENCE IN AUGUST.

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, HOOD RIVER, OREGON

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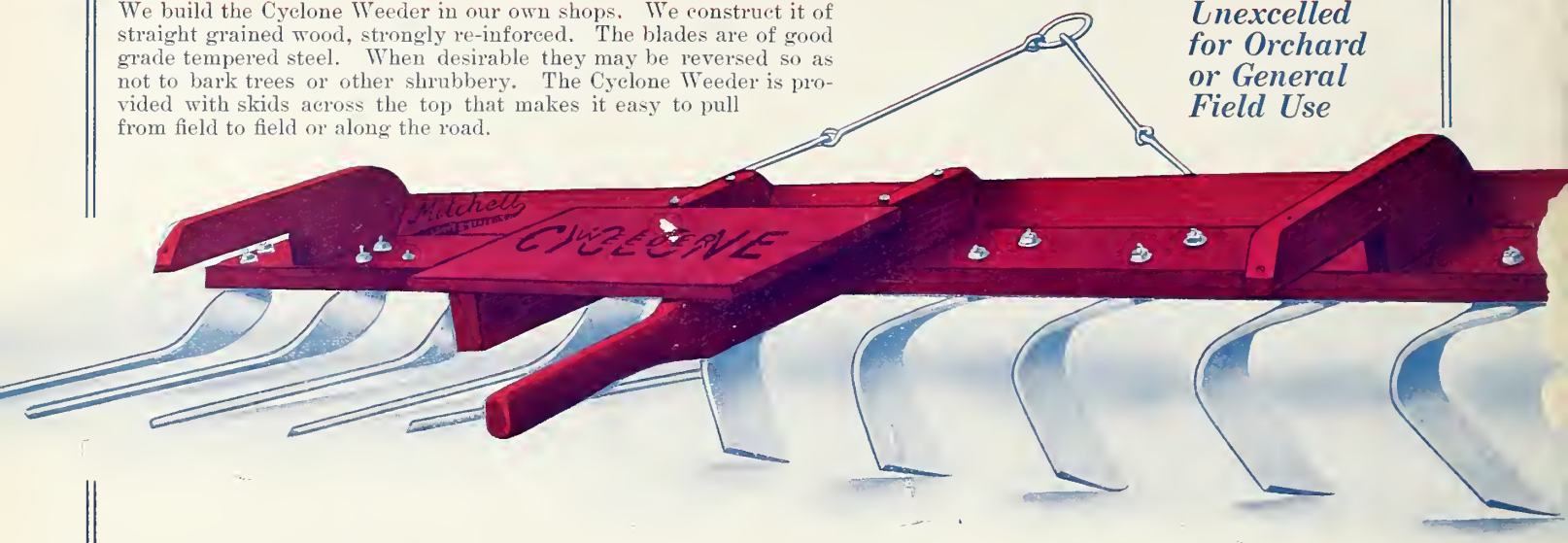

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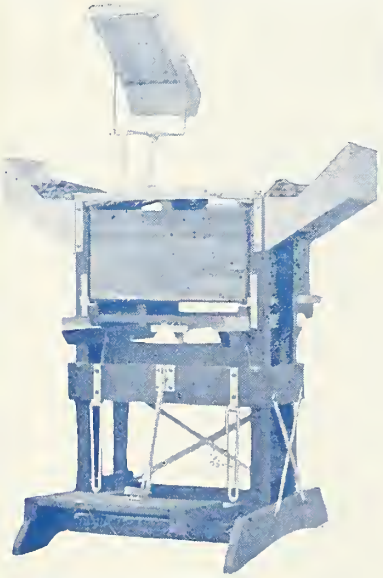

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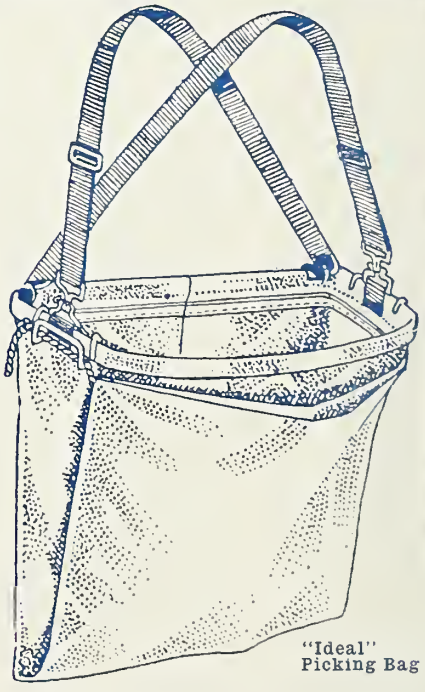

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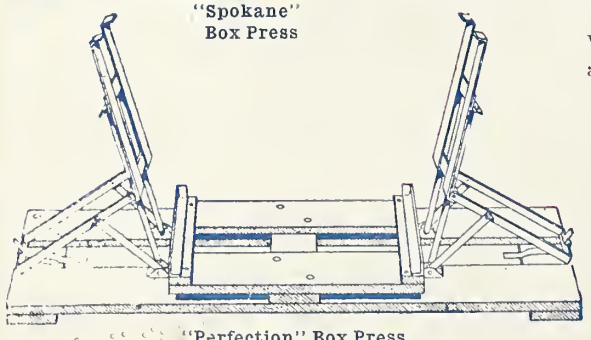

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believe, however, that the growers in the Northwest who see furthest, understand the mercantile trend of the trade as clearly as themselves, and that therefore they can continue to depend upon the co-operation of the grower who conducts his plant as a staple business for the fine fruit that is necessary in extending their trade as a staple business.

Steinhardt & Kelly

NEW YORK

OUR MARKET THE WORLD

BETTER FRUIT

AN ILLUSTRATED MAGAZINE PUBLISHED MONTHLY IN THE INTEREST OF MODERN, PROGRESSIVE FRUIT GROWING AND MARKETING

Status of the American Fruit Trade

By R. M. Rutledge

UNFORTUNATELY there are few statistics of American horticulture, and what few are available are scattered and incomplete. Before the eleventh census (1890) only a few bulletins of summaries were published. Since then the twelfth and the thirteenth (1900 and 1910) census figures give more complete and detailed figures as regards horticulture. Many of the horticultural societies and periodicals make annual summaries of the output by means of inquiries sent to their members and subscribers. The apple exporters have the records of the exports of this fruit. The Treasury, Agriculture and Commerce and Labor Departments of our national government issue bulletins from time to time dealing with exports and imports. But other than these there is little statistical measure of our horticultural progress. In collecting the following information I have consulted all available sources; in most cases I have merely taken the essential facts, but where an authority has expressed his idea clearly extracts have been incorporated in this article. The 1910 census gives these figures to show the comparative importance of the fruit crop and trade.

TABLE I

	Total Value of Crop in U. S. 1909	*Pct. Total Value Crops*	*Pct. Increase Over 1899*
All crops in U. S.	$5,487,161,223	100.00	83
All cereals	2,665,539,714	48.6	79.8
Hay and forage	824,004,877	15.0	70.2
Vegetables	251,686,244	4.6	75.3
Potatoes	166,423,910	3.0	69.2
All fruits and nuts	222,024,216	4.0	66.9
All small fruits	29,974,481	0.5	19.8
All orchard fruits	140,867,367	2.6	68.2
Apples	83,231,492	1.5	...
Peaches, nectarines	28,781,078	0.5	...
Plums and prunes	10,299,495	0.2	...
Pears	7,910,600	0.15	...
Cherries	7,231,160	0.14	...
All grapes	22,027,961	0.4	56.3
Tropical and sub-tropical	24,706,753	0.5	200.3
Oranges	17,566,464	0.35	...
All nuts	4,447,674	0.1	128.1
Flowers and plants	34,872,329	0.6	85.9
Nursery products	21,050,822	0.4	107.9
Total value of fruit imports (1910)	$23,220,792		
Total value of fruit exports (1910)	18,504,591		
Per cent of fruit crop exported (1910)	8.3%		

Early Mediterranean Importations

One hundred years ago the fruit merchant as such did not exist in this country. Some of the larger importers occasionally received a few half casks of dried prunes, currants, raisins or grapes from the Mediterranean, but beyond these even the luxurious did not aspire. It was some years before even so simple a custom as selling native fruit brought to town in season by the neighboring farmer became at all general with the old New York grocers. Having reached this point of development, the fruit trade stood still until after 1830, when the importation of foreign fruit was considered seriously. In 1832 there arrived at New York by sailing ship the first cargo of oranges from Sicily. Lemons followed almost immediately. The next thirty years saw the Italian fruits, oranges and lemons, holding full possession of the American market. At first the trade was largely speculative, but soon the system of auctioneering developed. These auction houses had the advantage of quick returns, and since their origin they have continued as important factors in the fruit trade. In 1865, the wholesale commission house having come to be a generally recognized feature of the fruit trade, many of the Italian growers began consigning their fruit directly to American firms. This arrangement, dispensing with the Italian middleman, was found the more profitable for both the grower and the American jobber, and for fifteen years the Mediterranean trade continued on these lines. About 1880 the third and last change in the methods governing the Italian fruit trade began with the establishment here of representatives of several of the large Italian houses. These houses have controlled the Mediterranean fruit trade since that time. Spain, once a large shipper of oranges, has been forced from the American market by the Italian growers, and excepting her grapes of Almeria and Malaga, and latterly her lemons, she sends little now to this country.

Competition of Domestic Fruit

Up to 1867 the foreign fruitgrower and shipper saw no cloud on the horizon of the American market. The lemon of Sicily and the sweet Messina orange competed only with the apple for Yankee favor. Grapes, raisins, currants, prunes, every European fruit—green, dried or preserved—found in the United States a market that was never glutted except by itself. Bananas and pineapples from the West Indies, Cuba and Central America, cocoanuts and tropical fruits of every description, came only in limited quantities. The foreign fruit controlled the market until the refrigerator car created the great interstate traffic and the importations of foreign fruits, excepting bananas and lemons, were driven into the background. In 1867 the first green fruit reached New York from California. But America has never produced a lemon which could successfully compete with the lemon of Sicily and the banana already stands near the head of the list of favorite fruits of the Americans, so these two fruits will always figure heavily in our imports.

Banana Trade Started

The first bananas were imported into the United States in 1804. Captain John N. Chester, of the little schooner "Reynard," was the skipper of this original West Indian "Fruiter," and thirty bunches were about as many as he thought the American market would stand at one consignment. For twenty-six years after that bananas were only occasionally brought to this country and in but small quantities, until in 1830 John Pearsall imported the first cargo. He chartered the schooner "Harriet Smith," and from her he landed in New York 1,500 bunches of bananas—the first large shipment. From that time the banana trade continued in a modest way—a few cargoes annually for a score of years. It was not until 1880 that the reports of importations listed bananas separately, and even then the value of the importations amounted to only $461,735. Then it was that the American growers began to feel the pressure of competition with the banana—a competition which has increased phenomenally and is not lessened by the recent tariff which has placed this tropical fruit ("the poor man's fruit") on the free list. That the banana trade is important may be realized by the fact that "in 1912 the continental United States alone consumed 44,520,539 bunches, or over sixty bananas for each man, woman and child in the Union."

TABLE II—PERCENTAGE OF VALUE OF ALL CROPS BY SECTIONS

Section	*All crops*	*Vegetables and potatoes*	*Fruits and Nuts*					
			Total	*Orchard fruits*	*Small fruits*	*Tropical & subtrop.*	*Grapes*	*Nuts*
All United States	100	7.6	4.0	2.6	0.5	0.5	0.4	0.1
Northeastern	100	21.5	7.0	5.2	1.7	...	0.1	...
Middle Atlantic	100	17.4	9.6	6.9	1.4	...	1.2	...
East-North Atlantic	100	6.9	3.0	2.2	0.5	...	0.3	...
West-North Atlantic	100	3.8	1.4	1.0	0.3	...	0.1	...
South Atlantic	100	9.8	3.8	2.1	0.6	1.0	0.1	...
East-South Central	100	7.5	2.4	2.0	0.3	...	0.1	...
West-South Central	100	4.8	1.4	0.8	0.3	0.1	...	0.1
Mountain	100	9.3	5.4	4.7	0.6	...	0.1	...
Pacific	100	8.1	21.4	9.2	1.2	6.0	3.9	1.1
The North	100	7.5	3.3	2.4	0.6	...	0.3	...
The South	100	7.5	2.6	1.7	0.4	0.4	0.1	0.1
The West	100	8.5	15.5	7.6	1.0	3.8	2.5	0.7
East of the Mississippi	100	9.9	4.2	2.9	0.7	0.3	0.3	...
West of the Mississippi	100	4.9	3.9	2.1	0.4	0.7	0.5	0.2

Banana Supply of the United States

The consular returns for 1912 show that this tremendous supply of fruit comes from the following countries: Jamaica, 15,467,918; Honduras, 7,151,178; Costa Rica, 7,053,664; Panama, 4,581,500; Cuba, 2,478,581; Nicaragua, 2,270,100; Guatemala, 2,017,650; Colombia, 1,542,988; Mexico, 817,006; British Honduras, 557,160; Dominican Republic, 304,000; Dutch Guiana, 261,548; others, 17,246; a grand total of 44,520,539 bunches. The same records show that the world supply in 1911 equals about 52,915,963 bunches. Excepting the Canary Islands all of the banana-producing countries border on the Caribbean Sea. From these figures it may be seen that the United States consumes about 85 per cent of the entire banana crop of the world. Much of the remaining 15 per cent passes through the ports of this country, making the banana trade both an export and an import business. In recent years a European taste for this fruit has been developed and direct importations have been made; although the amount sent into the United States will tend to increase rather than decrease, the increased demands of the rest of the world will be made up by an increase of production, for the area capable of producing bananas has scarcely been touched. Although the first full shipload reached the American market in 1830, it was not until 1900 that the English demand warranted a full cargo. And as late as 1912 the first cargo of bananas reached continental Europe; this was landed in Germany in poor condition, but late in that year a really marketable full cargo was shipped direct to that country. One immense Yankee company controls nearly the entire banana trade of the world.

TABLE III—IMPORTS OF FRUITS INTO THE UNITED STATES

	1900	1910	1912
Raisins	$531,124	$296,047	$295,466
Currants	916,908	1,190,020	1,561,350
Plums, prunes	47,700	.....	.....
Dates	410,349	516,714	536,983

Note—Blanks not of sufficient quantity to be listed.

	1900	1910	1912
Oranges	$1,087,041	$82,457	$108,880
Lemons	3,666,881	3,136,933	3,368,863
Bananas	5,877,835	11,612,693	14,368,330
Pineapples	.....	1,317,462	1,110,341
	1900	1910	1912
Olives	.....	$1,659,801	$2,303,277
Figs	.....	775,319	934,763
Grapes	.....	1,682,994	2,331,504

	Total 1900	Total 1910	Total 1912
Fresh and dried fruits	$16,284,758	$23,220,792	$28,613,273
Fruit juices	63,302	45,508	.....
Nuts	2,978,834	13,246,742	15,828,003
	Total 1900	Total 1910	Total 1912
Preserved fruits	$1,243,479	956,368	936,107
Agricultural imports	420,139,288	687,509,115	783,457,471

Percent of Fresh, Dried and Preserved Fruits in Total Agricultural Imports

1900	4.2%
1910	3.6%
1912	4.0%

Apples Our First Fruit Export

"The export trade in fruit seems to have begun with the apple, as a large supply existed in close proximity to the seaport towns. Trade in this fruit with the West Indies probably developed early in the eighteenth century, though we have no record of shipments until 1741, when it is stated that apples were exported from New England to the West Indies in considerable abundance. No trans-Atlantic shipment has been disclosed earlier than that of a package of Newtown Pippins of the crop of 1758 sent to Benjamin Franklin while in London." The sight and taste of these apples later resulted in quite a trade, for a letter written in 1773 by the younger Collinson to John Bartram states that the apple crop of England had failed and that the market was being supplied with American apples. He says: "They are, notwithstanding, too expensive for common eating, being sold for twopence, threepence, and even fourpence an apple." Thus it came about that apples made up the first shipments of our export fruit trade, and for many years this was the only fruit shipped away. Even now "King Apple" controls the major part of our export trade. "Shipments of ice from New England ports to the West Indies, which began in 1805, were accompanied by large quantities of apples, and soon after the extension of the ice trade to India and China, which occurred in 1830, American apples could be had in the ice ports of those countries." But statistics do not exist prior to 1821, when the Treasury reported an export of 68,443 bushels of apples valued at $39,966.

Apple Exports to Europe

In the "Transactions of the American Institute" (1843, page 125), it is said that the Boston fruit dealers had shipped apples and cranberries to Europe for many years. "In 1845 Newtown Pippins from the orchard of Robert L. Pell of Ulster County, New York, which contained 20,000 trees, sold in London at $21.00 a barrel." At a later date shipments of the same variety and others from the Piedmont and Mountain districts of Virginia were sent out. Since then the shipments of apples have figured heavily in our export trade and they promise to increase in the near future—especially now since the apple-package standardization has been passed. The Eastern States still furnish a large part of the apples exported, but shipments from the great orchard districts of the Mississippi Valley and the Pacific Coast now are a very large factor. New York has always held the lead in the exportation of apples from the American continent to Europe. A glance at Table IV will show that the ports in the order of their importance as shippers of barreled apples in 1912-13 were approximately: New York, 32 per cent of the total; Boston, 16 per cent; Montreal, 12 per cent; Portland, Maine, 10 per cent; Halifax and St. Johns, 30 per cent. Other ports that at one time or another have entered the race are: Philadelphia, Baltimore, Newport News, Norfolk, Annapolis and Wolfville. With the exception of the last two mentioned, none of the ports have had enough to list since 1897-98, and Wolfville has entered the race only once, in 1904-5. Boxed apples have only been listed separately since 1898-99, and since that time several ports have exported them. In 1912-13 the percentages of the trans-Atlantic exportation of boxed apples were about: New York, 93 per cent; Boston, 6 per cent; Portland, Maine, 1 per cent.

English Imports of Apples

Liverpool, London and Glasgow have always taken most of our exports of apples, but since 1896-97 Hamburg and other continental ports have figured heavily. England imports large quantities of apples from the United States and Canada, as well as some from other countries. Their relative importance is shown by the following approximate percentages:

ENGLISH IMPORTS OF APPLES

	1911	1912
United States	44%	43%
Australia	9	10.5
Belgium	0.8	1.3
Canada	41	42.7
France	1.6	0.4
Portugal	2.6	2
All others	1	0.6
	100	100
Total in hundredweight	3,332,618	3,881,946

"Distribution by the importing fruit brokers is either by private sale or by auction. When large quantities are to be dealt with, the latter method is the most general, but where the supply is short private sales are frequently better. Brokers prefer to be in a position to adopt either method, according to their judgment of market conditions at the time." In 1912-13 the American imports came in at the ports as follows: Liverpool, about 35 per cent of our total export of barreled apples and about 22 per cent of our export of boxed apples; London, 19 per cent of the barreled and 38 per cent of the boxed apples; Glasgow, 18 per cent of the barreled and 7 per cent of the boxed apples. Of the boxed apples taken into Great Britain, Washington supplies about 60 per cent and Oregon and California each about 20 per cent.

European Imports of Apples

The importation of fresh apples is enormous in Germany, coming principally from the United States and Australia and consisting largely of boxed apples. The Australian shipments are entirely of boxed apples, but they do not compete with the North American fruit, for the season of the Australian apples is from April to the end of July, whereas that of the fruit from the United States has a season from October to April. An idea of the extent of the importation may be had from the fact that in 1912-13 300,000 boxes and 230,000 barrels of North American apples were handled at Hamburg, the latter originating in the Eastern States and Canada, while the former came principally from Washington and Oregon. Hamburg is the distribution center for all Germany. Of the 1912-13 crop Hamburg took about 8 per cent of the barreled and about 12 per cent of the boxed apples. Austria, France, Italy, Russia, Spain and Switzerland rarely import any American apples except in an off year for their own crops. Belgium's importations of apples come by way of London and Southampton from California,

Oregon, Washington, Canada and South Africa; the total of all for the year 1912 was valued at $71,420. The Netherlands imports quite a quantity of apples, principally from the United States, Australia and Nova Scotia, through the port of Rotterdam. Owing to lack of data it is impossible to give the exact amounts of this importation. So likewise it is impossible to separate the amount of apples imported by Norway, which in 1912 amounted to 325,557 pounds from the United States and Australia.

Apple Exportations to South America

Our apple trade with our sister continent has been very under-developed. Now, however, owing to the increasing prosperity of South America, exportations of American apples are finding their way into that market. At present the industry is only in its infancy, but it is hoped that the solidity and flavor of the American apple will enable it to travel long distances and hold its own against all comers. Argentina, Brazil and Uruguay all have small importations of our apples, but due to the fact that refrigeration facilities are very inadequate on the few transportation lines between our ports and those of South America these have been very limited in quantity and costly when landed in those trans-equator ports. American apples are unknown in Chile as well as many other parts of the West Coast, but with the advent of the Panama Canal this will probably be remedied. Venezuela imports some of our apples from the Northwest, but it is only at great cost incurred by transshipping over the Isthmus; these come principally from Washington and Oregon. Mexico started some importation of our apples a few years ago when refrigerator cars could be sent to Mexico City, but due to the unsettled condition of the country and the impossibility of maintaining rapid transportation, this has ceased. However, some think that even in the present state of affairs a profitable trade could be built up with the seacoast towns. All of this trade is growing rapidly, as may be noted from one day's shipments: On October 18, 1913, to Rio de Janeiro, Brazil, went 200 boxes; to Bahia, Brazil, 128 boxes of apples; to Buenos Ayres, Argentina, went 3,274 boxes and 464 barrels of apples.

Apple Exportations to Other Continents

We in the Northwest are accustomed to think of Asia as a "big" market for our apples, but as a matter of fact only a very small amount of first-class stock is wanted in Asia. Hongkong, for instance, imported only 11,000 boxes from all countries in 1912-13; of this 2,000 boxes came from the Hood River district by way of Seattle, and 6,000 were second and third-class apples from San Francisco. Hongkong is the principal distribution center for imported fruits for continental Asia. India and Japan rarely see an American apple, according to the consular reports. South Africa imported some 700 or 800 boxes and barrels of apples in 1912-13 from California by way of London. This is largely a speculative proposition and will probably never be a basis for a permanent trade. Australia, though a large exporter herself during our summer, nevertheless imported some 61,000 cases of apples from the United States in 1912-13; of this amount 49,400 cases were from Washington and 11,600 cases were from California.

Other Fruit Exportations

In addition to apples, which comprise by far the greatest amount of our fruit exportations, there are various other fruits sent out, such as cranberries, peaches, plums, prunes, pears, grapefruit, oranges, etc. The supply of all but the first comes mainly from California. Our exportations to England have always been heavy, such as:

	1911, lbs.	*1912, lbs.*
Apricots and peaches...	415,000	2,330,000
Pears	132,946,000	91,445,000
Plums and prunes.....	2,478,000	6,330,000

Canada imports many of our tender fruits. Several other countries import certain of our fruits, but as a rule this is a very limited trade, and in the case of the Mediterranean countries the trade is absent altogether. Our trade with South America in fruits other than apples is rapidly growing. For instance, the exports to the south for one day (October 18, 1913) were: To Rio de Janeiro, Brazil, 1,270 boxes of pears and 120 boxes and 4,224 packages of other fruit; to Buenos Ayres, Argentina, 970 boxes of pears and 800 packages of other fruit.

Export of Dried Fruits

Since about 1895 increasing export shipments of dried apricots, peaches and prunes have been made from California, and this branch of the trade promises soon to reach large proportions. Dried apples have been exported for many years—in fact before accurate records of exports were kept. Exports of dried fruits have increased rapidly since the perfection of the fruit dryer, which occurred about 1870-75. Not all European countries draw upon this country for their dried fruits, and some buy only in off years for their own fruits. "It is estimated by dealers that there are imported annually into Austria twenty carloads of dried apricots, twenty carloads of dried apples, pears and cherries, thirty carloads of dried prunes, or about seventy carloads—1,500,000 pounds—from America." Much of this fruit is brought in by way of England and Germany, so these figures seem inaccurate. Belgium imported from America in 1912 dried apples to the extent of $121,985; dried apricots, $52,665; dried prunes, $136,115. France imports much, but this is entirely dependent upon her own crops. Germany imports much along this line from the United States, but Italy, Norway and the Netherlands import very little of dried fruit from us. Russia imports a very little and our dried fruit is never seen in Switzerland. England imports very little from us other than prunes and plums, of which she imported in 1912 114,063,000 pounds of plums, and 28,902,000 pounds of prunes. Asia, South Africa and Australia report practically no importation of dried fruits from the United States. It would seem as though India, China and Japan especially would prove fertile fields for exploitation. Canada imports a very little and Mexico practically none at present, owing to the unsettled condition of the country. Our trade in these goods with South America is not a general trade and is confined to a few cities only; this trade has a bright future before it. For instance, Chile and the other countries on the West Coast, as well as Venezuela and other northern countries, do not know our dried fruits. Uruguay and Argentina import to a limited extent. The growth in this trade may be measured by the figures for Brazil. In 1911 this country imported $14,097 worth of dried fruits, and in 1912 it imported them to a value of $19,544 from the United States—an increase of over 35 per cent.

Intra-United States Fruit Trade

As has been noted, the foreign fruits controlled the American market up to the time of the Civil War, and except for a poorly developed apple trade and an unreliable trade in small fruits from New York, New Jersey, Long Island and Delaware there was no domestic competition. Once in a while a sloop loaded with watermelons from the South reached New York, but there was no systematized trade as there is today. Sometimes the peach crop of Delaware failed and California was not ready, as she is today, to come to the rescue. According to Mr. W. D. Barns of Middlehope, New York, "The planting of commercial apple orchards did not receive much attention in New York till 1820 to 1825, although Robert Pell of Esopus had about twenty acres of bearing Newtown Pippin trees from which he exported fruit as early as 1825 to 1830. Along the Hudson, where the fruit could be easily transported to New York City by boat, the trade included a large number of summer and fall apples as well as the winter varieties. They were shipped in straw-head barrels. Some were contracted for by the dealers in New York and some were sold by the captain of the steamboat that carried them to the city." As transportation facilities gradually improved by the opening of canals and railways the farmers in many interior localities found that they could send their fruit to other than local markets and receive profitable returns. Accordingly commercial orcharding began to attract attention, especially in regions which were found to be naturally favorable to the production of good apples. From 1850 to 1860 the number of commercial orchards which were planted increased rapidly, particularly in Western New York. The most potent single factor in this growth was the opening of the Erie Canal in 1825. This afforded cheap transportation from the greatest fruit region in the world.

TABLE V—APPLE EXPORTS FOR SEASON 1913-14
(Copyright 1914, by Mahlon Terhune)

	PORTS OF EXPORT						PORTS OF IMPORT						
1913	New York Barrels	Boston Barrels	Montreal Barrels	Portland Barrels	Halifax Barrels	St. John Barrels	Liverpool Barrels	London Barrels	Glasgow Barrels	Hamburg Barrels	Manchester Barrels	Various Barrels	Total Barrels
Aug. 2	184	....	....	....	....	....	54	....	130	....	....	....	184
" 9	258	....	....	....	....	....	50	....	208	....	....	....	258
" 16	869	....	....	....	....	....	393	....	476	....	....	....	869
" 23	1,806	....	....	....	....	....	398	17	1,391	....	....	....	1,806
" 30	2,769	45	....	....	....	....	1,192	167	1,155	....	....	....	2,814
Sept. 6	4,967	534	363	....	....	....	2,515	66	3,283	....	....	....	5,864
" 13	7,350	820	880	....	3,079	....	6,638	649	4,518	....	324	....	12,129
" 20	12,818	1,619	1,445	....	23,910	....	12,340	9,669	17,783	....	....	....	39,792
" 27	17,785	2,393	7,493	....	23,177	....	10,315	24,468	14,863	....	1,202	....	50,848
Oct. 4	25,812	9,549	18,007	....	7,075	....	22,023	3,457	28,969	2,419	259	3,316	60,443
" 11	33,465	7,023	23,773	....	43,679	....	36,906	22,380	25,520	11,115	....	9,019	107,940
" 18	57,934	32,998	29,026	....	47,914	....	69,681	28,049	38,542	28,245	1,279	2,076	167,872
" 25	41,549	21,962	22,952	....	14,600	....	37,729	8,142	28,168	16,321	5,000	5,703	101,063
Nov. 1	39,209	34,910	20,410	....	35,110	....	14,713	34,293	13,947	17,896	5,545	13,245	129,639
" 8	24,848	23,931	25,194	....	16,359	....	33,136	20,599	21,790	5,463	5,814	3,530	90,332
" 15	17,036	18,695	21,681	....	8,935	....	28,857	3,978	12,422	14,712	3,307	3,071	66,347
" 22	30,719	56,105	27,606	....	13,833	....	37,844	22,363	28,432	21,285	789	17,550	128,263
" 29	28,199	10,904	21,709	....	37,962	929	28,957	32,375	12,043	12,779	4,339	9,210	99,703
Dec. 6	22,929	23,804	37,875	....	18,225	3,048	59,295	15,484	19,802	2,812	6,589	1,899	105,881
" 13	23,420	7,917	....	9,900	20,892	2,555	14,323	10,935	28,046	3,289	....	8,091	64,684
" 20	7,934	5,462	....	8,120	278	2,880	10,875	2,445	4,354	801	4,713	1,486	24,674
" 27	10,603	9,107	....	8,606	29,174	....	20,159	23,103	5,115	3,566	3,417	2,130	57,490
1914													
Jan. 3	17,854	7,304	....	10,426	....	2,516	13,318	4,770	7,475	5,490	....	7,047	38,100
" 10	14,370	10,060	....	6,657	32,114	1,335	18,737	28,628	6,825	3,829	3,608	2,909	64,536
" 17	14,334	7,304	....	4,336	10,124	2,364	11,043	8,975	8,250	3,189	....	7,005	38,462
" 24	7,652	6,613	....	6,712	22,394	723	12,268	20,326	4,855	881	....	5,764	44,094
" 31	18,361	4,412	....	3,636	9,909	1,771	18,737	6,404	3,324	3,467	213	5,944	38,089
Feb. 7	12,163	8,257	....	3,632	22,152	2,327	13,204	23,991	4,594	2,797	3,912	33	48,531
" 14	9,918	5,673	....	2,064	1,748	....	7,607	3,012	4,085	2,453	....	2,246	19,403
" 21	8,376	1,984	....	2,686	16,683	1,033	8,514	17,265	2,831	1,752	....	400	30,762
" 28	8,619	3,676	....	2,678	2,164	1,562	8,166	6,999	2,271	....	....	1,263	18,699
Mar. 7	6,231	9,501	....	....	7,956	....	7,725	9,588	635	1,886	3,146	708	23,688
" 14	8,371	5,702	....	6,420	14,200	....	15,092	12,756	2,880	2,040	....	1,925	34,693
" 21	9,409	1,407	....	3,751	6,159	2,574	9,561	12,904	835	....	....	....	23,300
" 28	8,331	4,618	....	....	6,247	....	10,374	5,295	1,768	....	....	1,759	19,196
April 4	2,625	4,406	....	1,928	160	....	6,276	413	290	....	....	2,170	9,149
" 11	1,884	2,182	....	....	....	....	2,639	210	1,217	....	....	....	4,066
" 18	239	1,614	....	261	....	....	1,212	....	28	....	....	874	2,114
" 25	160	....	....	....	....	....	160	....	....	....	....	....	160
Totals	561,390	352,491	258,414	81,813	496,212	25,617	643,026	424,175	363,420	171,487	53,456	120,373	1,775,937
*Boxes	739,219	128,127	....	....	....	....	211,539	239,913	83,904	211,875	29,921	89,294	867,346

*Note—These figures are included in the above shipments, three boxes to barrel.

TABLE IV—COMPARISON OF APPLE EXPORTS (TRANS-ATLANTIC) 1880-81 TO 1913-14
(Copyright 1914, by Mahlon Terhune, New York)

	PORTS OF EXPORT							PORTS OF IMPORT					
	New York	Boston	Montreal	Portland	Halifax & St. John	Various	Annapolis	Liverpool	London	Glasgow	Hamburg	Various	Total
1880-81	599,200	510,300	145,276	39,908	24,250	9,972	....	839,444	177,936	216,391	....	95,036	1,328,806
1881-82	75,889	65,093	56,433	6,497	13,805	....	21,535	133,784	46,147	59,266	....	55	239,252
1882-83	169,579	102,409	64,190	16,890	18,542	3,900	19,893	253,432	46,975	81,269	....	13,318	395,594
1883-84	53,048	7,145	7,445	9,811	3,758	325	....	46,661	4,843	29,685	....	343	81,532
1884-85	256,314	307,130	84,487	71,460	41,207	....	8,612	491,898	123,081	137,631	....	16,590	769,210
1885-86	466,203	221,724	68,716	87,301	37,982	186	3,161	537,695	147,102	176,445	....	24,031	885,273
1886-87	175,595	303,479	106,713	100,569	94,606	....	26,965	468,553	187,840	138,756	....	12,775	807,924
1887-88	275,696	163,916	93,058	25,215	32,652	....	17,884	346,557	104,072	139,517	....	18,275	608,421
1888-89	474,337	382,199	201,307	145,825	94,691	860	18,190	790,502	279,374	272,068	....	64,465	1,407,409
1889-90	169,557	152,569	162,526	122,433	53,627	....	37,030	418,850	128,248	116,449	....	14,115	677,762
1890-91	76,503	23,123	182,095	80,365	89,190	....	....	252,548	116,705	80,772	....	1,260	451,285
1891-92	537,247	339,964	320,457	163,145	87,379	2,174	....	917,535	224,356	282,553	....	25,892	1,450,336
1892-93	218,037	204,138	429,243	235,395	116,725	....	....	798,291	174,405	220,790	....	10,052	1,203,538
1893-94	29,396	4,796	56,255	49,344	35,058	....	....	101,205	32,581	38,524	....	2,530	174,841
1894-95	221,398	523,123	273,353	155,878	264,410	....	....	853,198	388,535	173,312	....	23,110	1,438,155
1895-96	230,705	84,771	128,027	141,955	165,797	....	....	410,596	196,184	127,942	....	16,533	751,255
" Boxes	13,610	....	1,861	....	....	....	....	11,342	2,458	1,771	....	....	15,471
1896-97	570,327	1,015,029	700,274	221,350	409,733	3,133	....	1,581,560	716,771	411,575	117,105	92,835	2,919,846
1897-98	361,894	176,322	163,313	126,261	82,208	3,998	....	490,138	198,281	123,828	88,780	12,969	913,996
1898-99	158,213	237,395	404,573	143,892	277,014	....	....	689,036	271,342	180,336	22,861	57,512	1,221,087
" Boxes	176,107	....	....	4,529	1,349	....	....	81,484	87,188	9,226	1,531	2,556	181,985
1899-100	306,889	177,660	285,528	148,892	360,799	....	13,400	644,857	319,869	211,555	72,150	44,690	1,293,121
" Boxes	149,515	....	....	....	....	....	....	58,922	70,724	13,118	4,826	1,925	149,515
1900-01	240,635	409,979	249,219	225,396	200,000	....	20,801	814,100	251,322	225,061	26,728	28,919	1,346,030
" Boxes	203,333	....	....	....	....	....	....	60,776	111,307	22,925	1,325	7,000	203,333
1901-02	154,223	143,851	122,465	100,419	271,230	....	....	408,655	229,808	129,312	18,296	6,077	792,128
" Boxes	296,427	....	....	....	....	....	....	109,715	153,653	20,449	2,929	9,681	296,427
1902-03	732,764	838,815	476,425	358,080	156,675	....	....	1,445,347	457,778	398,271	146,671	94,692	2,542,759
" Boxes	212,587	....	....	....	....	....	....	69,020	126,730	11,782	4,627	488	212,587
1903-04	1,120,284	676,593	732,044	361,364	594,635	....	20,414	1,616,037	869,572	471,950	283,212	261,563	3,505,334
" Boxes	388,975	....	....	....	....	....	....	107,260	188,643	24,302	23,486	45,284	388,975
1904-05	654,443	680,398	375,085	304,921	372,369	8,500	15,907	1,130,220	552,692	394,090	158,568	176,053	2,411,623
" Boxes	66,001	....	20,529	738	53	....	....	17,154	32,254	24,484	....	13,429	87,321
1905-06	609,847	440,440	551,914	247,516	336,414	....	....	913,652	486,657	351,375	180,795	223,652	2,186,131
" Boxes	416,266	....	....	....	....	....	....	127,199	196,372	24,067	14,656	53,972	416,266
1906-07	668,866	521,241	399,161	375,345	342,476	....	....	1,084,810	464,240	404,838	163,523	189,678	2,307,089
" Boxes	252,011	....	....	....	....	....	....	87,067	128,024	10,307	3,878	22,735	252,011
1907-08	484,779	431,852	624,159	423,929	504,809	....	....	1,179,323	593,110	445,726	104,882	146,487	2,469,528
" Boxes	285,206	....	....	....	....	....	....	98,609	151,363	11,958	2,208	21,068	285,206
1908-09	363,327	188,911	353,146	89,403	560,887	....	16,908	674,700	406,253	311,389	14,910	142,363	1,572,615
" Boxes	520,792	....	....	....	....	....	....	208,383	213,969	41,708	3,263	23,469	520,792
1909-10	398,941	263,623	587,287	240,820	682,515	....	39,265	878,052	615,354	452,853	73,931	192,224	2,212,474
" Boxes	460,362	....	....	....	....	....	....	145,486	211,873	45,388	22,516	35,099	460,362
1910-11	651,738	487,896	172,729	110,339	211,275	....	....	649,055	446,672	324,876	71,773	142,601	1,634,977
" Boxes	959,980	146,630	....	....	....	....	....	361,268	501,964	94,465	77,981	70,932	1,106,610
1911-12	551,663	447,685	270,951	236,602	1,271,126	....	17,574	962,262	756,056	537,306	283,065	229,338	2,768,027
" Boxes	456,278	130,757	....	....	....	....	....	189,331	226,091	44,242	70,634	56,531	587,035
1912-13	982,318	551,607	337,670	280,929	808,473	....	....	1,125,670	740,145	548,068	258,543	288,571	2,960,997
" Boxes	1,353,235	28,623	....	3,133	....	....	....	389,084	586,566	106,982	172,208	198,457	1,453,577
1913-14	561,390	352,491	258,414	81,813	521,829	....	....	643,026	424,175	363,420	171,487	173,829	1,775,937
" Boxes	739,219	128,127	....	....	....	....	....	211,539	240,613	83,904	211,775	119,515	867,346

California Shipments Start in 1867

This was the condition of the American fruit trade when in 1867 the first consignment of green fruit from California reached New York. This experiment cannot be considered a success either by the condition of the fruit upon arrival or by the profits obtained in the transaction. But the idea stuck and soon there were other trials, resulting in November of the following year in the shipment of one car of grapes and three cars of pears from California to N. R. Doe of New York City. The pears came through in good condition and sold for $3.50 to $5.00 per box, while the grapes, principally Tokays, brought from $10.00 to $15.00 per forty-pound crate. The express company received $1,200 for the car of grapes, which came through attached to a passenger train. In addition to peaches, pears, Tokay and other grapes, California also ships out a large crop

of oranges, apricots, lemons, etc., and today leads the country in green-fruit production. In the matter of oranges California is a newcomer, not 5,000 boxes of that fruit from that state having been sold in New York prior to 1893, although Western markets knew them before that date. The orange groves of the golden state developed much more rapidly than did those of Florida, and for this reason have already outstripped those of the latter, which has, however, grown them much longer.

Florida Trade Starts

The Florida trade began in the early seventies, just after California had so successfully entered the market with her pears, peaches and grapes. Oranges were the first fruit sent out. Today Florida shares with California as the greatest source of supply for domestic tropical and sub-tropical fruits of all kinds.

Trade From Other Districts

Since that time many districts have developed a special fruit trade. Colorado and the Imperial Valley of California furnish most of the muskmelons, etc., for the United States. Louisiana, Texas, Florida and the other Gulf States hold the early vegetable and fruit supply for the Northern States. Michigan, Georgia and Connecticut each has a famous peach district; the Northwest has become world famous for its excellent boxed apples; some sections of New York have become continuous vineyards, and so on down the list of states, each locality having developed a specialized fruit industry now supplies the remainder of the country, the whole forming an immense interstate commerce of untold value.

Influence of Refrigeration

The use of cold storage in the transportation of fruits has increased greatly of late years, and we find a growing interest in this business from Canada to the Gulf. Perishable products are thus put into distant markets, and the season during which they may be had by consumers is very much lengthened. This has made possible such specialized fruit districts as the "Finger-Lake" region of New York, the Imperial Valley, the berry districts of the South, the citrus fruit districts of California and Florida and the apple industry of the Northwest. Refrigerator cars were first built for the meat trade. The meat was hung in cold storage houses, and was loaded into the cars at or near the freezing point. In a tight, well-built car such a cold load would warm up very slowly, and a small amount of ice served to carry it safely to its destination. When it was attempted to use these cars for fruit the hot load, fresh from the fields, soon melted the limited ice supply and the cars invariably arrived heated and in bad order. To use these cars successfully it was found necessary to build cooling houses at the shipping points, in which the fruit would be cooled off before loading, as in the case of meat. This caused delay in getting the fruit on the market and made much additional expense. However, it demonstrated the success of refrigeration for the transportation of fruits and soon cars were built especially for the fruit trade, so that any point having sufficient business to offer can secure efficient car service, with competent men to look after the proper loading and icing of the cars. The first use of ice for the transportation of fruits was in 1805, when the ice trade was extended to foreign countries; at that time apples were shipped even to the Orient. The modern "Bohn" system of steamship refrigeration allows fruit transportation practically around the globe. The first use of the refrigerator car was for the transportation of oranges from California. The first attempt at carrying very perishable fruits was in 1868, when the first attempt at carrying carloads of strawberries under refrigeration was made by Mr. Davis of Detroit, Michigan. This and following attempts failed—the first successful car being sent in 1872 from Anna, Illinois, to Chicago—these berries having been pre-cooled. This constituted the first use of pre-cooling as applied to the transportation of fruits. Today the refrigerator car and steamer are absolutely necessary to the fruit trade. Cold storage of fruit has been practiced ever since the first storage of ice, or even before that time when perishable products were stored in cellars. Today the cold storage industry is very necessary, as it permits of a longer period of sale and consumption and to a large extent prevents glutting the market.

TABLE VI—EXPORTS OF BOXED APPLES FOR SEASON 1913-14 FROM NEW YORK
(Copyrighted 1914, Mahlon Terhune)

	Liverpool Boxes	London Boxes	Glasgow Boxes	Hamburg Boxes	Bremen Boxes	Manchester Boxes	Various Boxes	Total Boxes
1913								
Sept. 6	640	....	....	....	....	....	....	640
" 13	1,640	1,903	....	....	....	....	....	3,543
" 20	....	4,584	....	....	....	....	....	4,584
" 27	3,537	7,281	1,583	....	....	....	....	12,401
Oct. 1	7,599	6,177	....	2,081	637	....	....	16,494
" 11	5,542	9,001	....	2,582	664	....	....	17,789
" 18	12,947	12,715	2,590	10,316	2,520	....	....	41,088
" 25	7,528	17,922	3,140	7,228	1,275	....	....	37,093
Nov. 1	12,080	22,664	2,546	9,373	5,177	....	104	51,944
" 8	8,363	21,708	3,176	12,234	3,866	....	....	49,347
" 15	8,913	9,155	....	15,965	5,957	....	600	40,890
" 22	6,413	5,321	8,985	23,502	4,641	....	1,854	50,716
" 29	7,535	6,799	5,583	16,393	8,204	....	....	44,514
Dec. 6	5,443	8,475	8,666	6,522	1,256	....	....	30,362
" 13	9,007	6,190	5,182	9,838	7,884	....	840	39,241
" 20	2,253	4,596	2,757	1,865	1,295	....	600	13,366
" 27	2,948	2,050	....	10,700	3,764	....	600	20,062
1914								
Jan. 3	3,209	5,465	3,804	13,841	3,321	....	2,885	32,525
" 10	6,920	2,190	3,669	9,568	....	....	....	22,647
" 17	6,563	9,732	....	9,637	4,645	....	2,680	33,257
" 24	3,896	9,818	789	1,955	1,200	....	1,200	18,858
" 31	6,534	5,618	3,025	10,256	4,981	640	6,490	37,544
Feb. 7	7,439	5,305	1,383	7,537	....	....	100	21,764
" 14	4,123	6,317	2,032	7,359	....	....	1,280	21,111
" 21	4,057	3,476	2,201	5,256	....	....	1,200	16,190
" 28	4,206	8,059	730	....	3,150	....	640	16,785
Mar. 7	3,838	....	946	5,659	....	....	1,306	11,749
" 14	2,589	361	404	6,120	....	....	....	9,474
" 21	2,365	5,861	994	....	....	....	....	9,220
" 28	2,314	1,448	166	....	....	630	200	4,788
April 4	1,952	241	720	....	....	....	1,938	5,151
" 11	2,428	630	384	....	....	....	....	3,448
" 18	....	....	....	....	....	....	640	640
" 25	3,282	630	....	....	....	....	....	3,912
Totals	168,133	212,592	65,755	205,787	64,437	1,270	25,157	743,131
Boston	46,688	28,651	18,149	5,988	....	28,651	....	128,127
Grand totals	214,821	241,243	83,904	211,775	64,437	29,921	25,157	871,258

COMPARISONS WITH OTHER SEASONS

	Liverpool	London	Glasgow	Hamburg	Bremen	Hull	Various	Total
1899-1900	58,992	70,724	13,118	1,925	....	4,826	....	149,515
1900-01	61,602	107,752	22,415	1,325	....	7,000	....	200,094
1901-02	109,715	153,653	20,449	2,929	....	9,681	....	296,427
1902-03	69,020	126,730	11,722	488	....	4,629	....	212,587
1903-04	107,260	188,643	24,302	23,486	....	19,814	25,470	388,975
1904-05	17,154	32,254	24,484	....	....	....	13,420	87,321
1905-06	131,172	196,516	24,067	14,938	13,025	20,657	15,371	415,740
1906-07	87,067	128,024	10,307	3,878	....	....	22,735	252,011
1907-08	98,609	151,363	11,958	2,208	....	....	21,068	285,206
1908-09	208,383	243,969	41,708	3,263	17,858	3,198	2,413	520,792
1909-10	170,139	249,990	48,054	22,516	21,883	....	18,152	530,734
1910-11	361,268	501,964	94,465	77,981	18,386	....	52,546	1,106,610
1911-12	189,334	226,094	44,242	70,634	10,482	....	46,249	587,035
1912-13	389,084	586,566	106,982	172,208	94,272	30,705	73,840	1,453,577
1913-14	214,821	241,243	83,904	211,775	64,437	29,921	25,157	871,258

TABLE VII—EXPORTS OF FRUITS FROM THE UNITED STATES

	1900	1910	1912
Dried apples.	$2,247,861	$2,056,292	$4,545,971
Green and fresh apples.	1,444,655	3,175,433	5,409,946
Oranges	271,468	2,213,905	3,022,859
	1900	1910	1912
Prunes	$1,646,332	$4,016,554	$4,969,053
Raisins	139,698	417,403	1,351,986
Other green, ripe & dried fruits	2,545,451	*2,119,210	*3,812,304

*Including apricots, peaches and pears.

	1900	1910	1912
Apricots		$1,218,423	$1,888,855
Peaches, dri'd		151,520	422,766
Pears, fresh.		302,958	784,627
	1900	1910	1912
Canned fruits	$3,127,278	$2,656,019	$4,012,463
Other preserved fruits	63,448	176,474	136,870
Total fruits.	11,486,172	18,504,591	30,354,700

	Total Nuts (½ Peanuts)	Total Agricultural Exports	Per Cent Fruit in Exports
1900	$156,490	$844,616,530	1.3%
1910	381,063	871,158,425	2.1%
1912	608,938	1,048,433,768	2.9%

Small Fruits

The acreage of all classes of small fruits decreased between 1899 and 1909 from a total of 309,770 to 272,460 acres, or 12 per cent; likewise the total production was 7.9 per cent less, the only crop with an increased production being cranberries. Small fruits in general are grown rather uniformly throughout the United States. In acreage New York and New Jersey head the list, but many states produce crops excelling the New Jersey crop in value. Strawberries come from all

TABLE VIII—SMALL FRUITS IN THE UNITED STATES, 1909 CENSUS

	Total Value in 1909	Production in 1909 (Quarts)	Acreage	Relative Value Per cent
All small fruits	$29,974,481	426,565,863	272,460	100
Strawberries	17,613,926	255,702,035	143,045	58.8
Blackberries and dewberries	3,909,831	55,343,570	49,004	13.0
Raspberries and loganberries	5,132,277	60,918,196	48,668	17.6
Currants	790,431	10,448,532	7,862	2.8
Gooseberries	517,034	5,282,843	4,765	1.8
All other small fruits	1,810,982	38,870,687	19,116	6.0
				100.0

TABLE IX—ORCHARD FRUITS IN THE UNITED STATES, 1909 CENSUS

	Total Value	Production (Bushels)	Increase Over 1899, Pct.	Relative Value Pct.
All orchard crops	$140,867,347	216,083,695	1.8	100
Apples	83,231,492	147,522,318	15.9	59.1
Peaches and nectarines	28,781,078	35,470,276	133.0	20.4
Pears	7,910,600	8,840,733	33.4	5.6
Plums and prunes	10,299,495	15,480,170	76.6	7.3
Cherries	7,231,160	4,126,099	43.6	5.1
Apricots	2,884,119	4,150,263	57.1	2.0
Quinces	517,243	428,672	....	0.3
				100.0

sections of the country, but the South Atlantic States are the heaviest producers, having in 1909 a crop worth $3,565,529, or about one-fifth of the total value of the strawberry crop of the Union, on about one-fourth of the total acreage devoted to that crop. Taking the country over strawberries were produced in 1909 on about one-half of the land devoted to small fruits and represented about three-fourths of their total value. The production of blackberries is widely distributed, but the country's supply of currants, raspberries and gooseberries comes mainly from the North and West. Massachusetts, New Jersey and Wisconsin produce most of our cranberries. The increase of value of small fruits is not given for the different crops separately, but as a whole the berries showed an increase of 19.8 per cent of value with a decrease of 7.9 per cent in total production.

Orchard Fruits

The 1909 census shows a falling off in the number of trees of each kind of fruit since the census of 1899, but the total production had increased slightly during that time and the total value of the crop had increased 68.2 per cent. This last figure represented 2.6 per cent of the total value of all farm crops. The production of fruit is a business in every state of the Union, but the trade looks to California and New York for about 25 per cent of its domestic orchard fruits. Apples are the most important of our orchard fruit, their value in 1909 being 59.1 per cent of the total for all orchard fruits, or about 1.5 per cent of the total value for all crops. Although apple production is widely distributed throughout the United States, New York leads with 15.6 per cent of the total value of the crop, her nearest rival being Pennsylvania with about two-fifths of that amount. Peaches are grown more or less in all states, but California supplies 14.3 per cent of the trade, followed by Georgia and New York, each supplying about 7 per cent. Three-eighths of the supply of pears comes from California and New York, the remainder coming fairly uniformly from all sections. Of our plums and prunes about four-fifths of the total crop comes from the Pacific States (mainly California and Oregon), although the section has only about two-fifths of the total number of these fruit trees. In the production of cherries California, Indiana, Michigan and Ohio lead the country, but in area devoted to this crop the order of most importance is Ohio, Illinois, Indiana, Michigan and California. 98 per cent of our apricots come from California, with a sprinkling of trees in a few other other states. The quince crop can scarcely be considered commercially, a few home trees being found in nearly all states, their small surplus being ample for the local markets.

The Production of Grapes

Our grape crop has had a picturesque history since the first vain attempts in colonial days. Ohio and Missouri have in turn led the other states in production, but today 63 per cent of our crop comes from California, New York and Michigan. Practically all of our "European" grapes are produced in California, whereas New York and Michigan can produce only native American grapes of the Concord type. The grape crop for 1909 was valued at $22,027,961—an increase of 57.1 per cent over the value in 1899. The total production in 1909 was 2,571,065,205 pounds.

Tropical Fruits

The total value of the tropical and sub-tropical fruits trebled in the ten years between the twelfth and the thirteenth census figures. The production of citrus fruits alone increased 231.3 per cent. Much the greater part of the tropical and sub-tropical fruit produced in the United States is grown in California and Florida, the former producing 67.8 per cent and Florida 28.7 per cent of the total valuation. Of the oranges nearly three-fourths are produced in California, most of the remainder coming from Florida. Nearly the entire domestic supply of lemons comes from California. Although California produces a few grape fruits, the dealers receive nearly the entire supply from Florida. No other class of fruit has increased in production and popularity in the past decade as has the grapefruit or pomelo. The other citrus fruits are unimportant; these are limes, tangerines and kumquats, chiefly from Florida, and mandarines from Louisiana. The production of figs is widely distributed throughout the Southern states, although California leads with two-fifths of the crop. Arizona and California control the domestic supply of olives—a crop which has trebled in the last decade. Florida is the only source of supply within the United States for pineapples, bananas, avocado pears and mangoes. The guavas are known only in California and Florida, and loquats only in the former. The native supply of pomegranates and dates comes from several of the Southern and Southwestern States. The Japanese persimmon is produced only in California, Florida and Texas.

Seasons for Fruits

In general the season for apple selling may be told by the following table (1912-13):

TABLE XI—SEASON FOR APPLES—PER CENT OF SALES BY MONTHS

Month	Boston	Cincinnati	San Francisco
July	0.7%	1.2%	2.1%
August	3.3	3.3	10.4
September	6.3	8.9	19.5
Oetober	31.7	23.8	44.2
November	32.8	23.6	12.9
Deeember	12.0	16.4	2.4
January	3.9	2.7	4.0
February	3.8	6.4	1.6
March	3.5	6.9	0.6
April	1.7	4.7	0.6
May	1.3	1.7	0.05
June	0.1	0.4	2.2
	100.0	100.0	100.0

The amounts of apples handled by different markets may be estimated by the following examples (1912-13): Boston, Massachusetts, 785,663 barrels; Cincinnati, Ohio, 309,158; St. Louis, Missouri, 295,996; Louisville, Kentucky, 157,101, and San Francisco, California, 111,601 barrels.

The orange is a fruit which has a more even distribution throughout the year than has the apple. A glance at the following table will show the distribution according to months:

TABLE XII—SEASON FOR ORANGES—PER CENT OF SALES BY MONTHS (1912-13)

Month	Boston	Cincinnati	New York
July	...	1.5%	4.5%
August	...	2.0	3.5
September	0.2%	0.9	2.3
Oetober	1.4	1.1	4.8
November	13.3	6.2	6.8
Deeember	31.3	29.3	12.5
January	17.7	11.1	9.8
February	18.2	15.7	12.5
March	13.0	13.8	10.4
April	2.8	8.2	12.0
May	1.4	6.2	12.9
June	0.7	4.0	8.0
	100.0	100.0	100.0

TABLE X—TROPICAL AND SUB-TROPICAL FRUITS IN THE UNITED STATES—1909

	Total value in 1909	Production in 1909	Increase of production over 1899
Non-citrus fruits			
Figs	$ 803,810	35,060,395 pounds	178.3%
Pineapples	734,090	778,651 crates	672.6%
Olives	404,574	16,405,493 pounds	220.6%
Bananas	5,661	10,060 bunches	Not given
Avocado pears	10,100	4,920 crates	Not given
Guavas	11,628	354,062 pounds	—78.8%
Mangoes	5,739	5,278 pounds	Not given
Persimmons (Jap)	9,087	6,723 bushels	148.1%
Loquats	5,880	4,541 boxes	Not given
Pomegranates	4,203	152,825 pounds	Not given
Dates	533	9,947 pounds	Not given
Citrus fruits			
Oranges	17,566,464	19,487,481 boxes	217.0%
Lemons	2,993,738	2,770,313 boxes	215.9%
Grapefruit	2,060,610	1,189,250 boxes	3738.7%
Limes	12,478	11,318 boxes	—50.0%
Tangerines	68,770	38,752 boxes	Not given
Mandarines	6,553	3,896 boxes	Not given
Kumquats	2,826	1,112 boxes	Not given

In general the season of the greatest movement of fruits is (varying with locality): Pears, August to October; peaches, June to September; plums and prunes, September to October; cherries, June to July; grapes, August to November; strawberries, March to July; raspberries, blaekberries and currants, June to August; cranberries, September to October; pineapples, May to June; oranges (Louisiana), Oetober to Februaary; oranges (California), November to March, and oranges (Florida), December to Mareh.

Value of Fruits

It is a matter of painful knowledge to everyone that the produetion of foodstuffs has not kept paee with the demand, the result being inereased prices. But there is a wide variation in the rate of inerease of value of the different farm products, and this exceeds in nearly all cases the rate of inerease in the population.

TABLE XIII—PRICES OF FARM PRODUCE

	Average Value Per Unit		Increase		Increase in Production
Crop—Unit	1909	1899	Amount	Pct.	
All crops	...	...	...	66.6	83.0
All cereals	...	...	...	76.5	79.8
Hay & forage, ton	$8.45	$6.11	$2.34	38.4	70.2
Potatoes, bu.	0.42	0.35	0.07	18.8	69.2
Small fruits, quart	0.07	0.054	0.016	30.1	19.8
Orchard fruits, bu.	0.65	0.39	0.26	65.3	68.2
Nuts, lb.	0.07	0.04	0.03	46.5	128.1
Population	...	...	...	...	21.0

Fruit An Antedote for Booze

In the Deeember American Magazine Henry Detmers writes a little article entitled, "A New Cure for Drink." Mr. Detmers says that he has been in the saloon business for twenty years. He is not a drinker himself and none of his sons drink. Out of his experience he recommends the following cure for the liquor habit: I found early in my experienee that as a general rule—there are exeeptions, of eourse—a regular consumer of fruit was not a very good eustomer in my business. On the other hand, a typieal "booze fighter" seldom touches fruit. I always kept some apples behind the bar for my own use, and I often experimentally offered one to a "star eustomer," who almost invariably refused. The more I looked into this matter the more firmly I beeame eonvineed that these two habits clash. Not earing to have my boys aequire the one, I inoculated them with the other, and I have found that the fruit-eating habit early aequired aets as a perfect antidote to the liquor habit.

I mention apples especially beeause they are something like bread, one never tires of them, whieh is more than can be said of peaehes, pears and oranges. And apples, thanks to eold storage, ean be had every day of the school year. Why shouldn't the apple habit be cultivated in the public schools at public expense? School trustees could advertise for bids to supply the school. Then by means of a push-the-button contrivance placed at the boys' and girls' exits, each child could get his apple as he marched out to play at recess time. Two apples a day would do the work. Children have a veritable eraving for fruit.

Please understand I have no ax to grind. I do not own a single apple tree. I have never elaimed to have diseovered that fruit juiees act as a liquor antidote, although I have talked it for twenty-five years. Some three years ago an article appeared which claimed a Nebraska physieian as the diseoverer of the theory. The good doetor and I will never quarrel over it. He ean have the glory. I do not need it. I am only too glad to see that my views have gained some seientifie baeking.

If you remove the desire for drink, the liquor question will solve itself, and while poverty may not be banished, the general welfare of the people will be mueh improved, and even if my scheme is never adopted, I will feel a thousand times repaid for my pains if I can only convince the mothers of our country, those who have the means to do so, that to implant the fruit habit in their ehildren is the best assuranee for a temperate life.

The Development of the Apple from the Flower

By O. M. Osborne, Head of Horticultural Department, State Normal School, Lewiston, Idaho

THE development of the apple from the flower is a very eomplex biologieal proeess. The study of this development has been entirely limited in the past to the field of botany. It is now, however, demanding a close and careful study from all of the hortieulturists throughout the world, for it has been found that the size and shape of the fruit, the yield per aere and the time for spraying are all dependent upon environmental conditions during blossoming time that are to a great extent under the eontrol of man. To understand these environmental eonditions, let us begin with the flower itself. In plate I is a longitudinal seetion of a fully opened blossom. If each part is carefully studied it will be found that every one has an important part to play in the formation and development of the fruit. Although not eonstituting any part of the fruit and although dropping off within a few days, the beautiful white and pink petals serve as an attraction for the honey bees whieh visit the flower to obtain the neetar from the neetar glands. The neetar glands are not shown in this eut, but they lie at the base of the petals on the inner side. After neetar has undergone a partial digestion inside the bee it beeomes honey.

While elimbing about the flower to reaeh the neetar the bee brushes against the stamens or the male parts of the flower. From the little sae-like enlargements or anthers at the top of the stamens it receives a deposit of a powdery substance called pollen (the feeundating eells). You are likely familiar with the sight of a bee laden with pollen. If the little winged ereature is elosely examined it will be found that it carries the pollen in little collecting baskets formed of stiff hairs on the tibia of eaeh hind leg. Under a

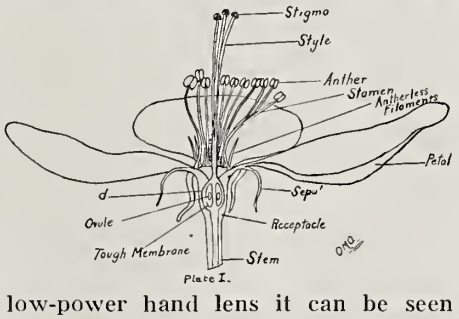

Plate I.

low-power hand lens it can be seen that the pollen catches onto other parts of the bee's body. Now when the bee rises to fly to a seeond flower (and it visits only one kind of a flower on a single trip) it may brush off a little pollen on the top of the stigma of the first flower, but sinee the stigma is raised above the stamens, as shown in the aeeompanying diagram, the ehanees are not as great as when the bee alights on a second flower. When it alights on the second flower it is almost certain to brush off a little pollen upon it, due to the stigma being situated above the anthers, as shown in the diagram. The pollen so deposited adheres readily on account of a sticky substance upon the stigma. Hence the flower invites through its friend, the bee, eross-pollination, and aims to prevent self-pollination by having the stigmas loeated far above the anthers, as before mentioned. Without the aid of the bees but very little, if any, pollen would ever reach the stigma, for the pollen of the apple is a trifle sticky and, unlike that of the eorn tassle, ragweed and several other familiar plants whieh are powdery, it eannot be distributed by the wind.

After the pollen has been deposited upon the stigma each individual grain begins to expand, due to the food and the stimulus present in the sticky sugary substanee on the stigma. Soon eaeh grain sends out a tube ealled a pollen tube, whieh penetrates the top of the stigma and grows down through the style to the ovary, where it reaehes the ovules shown in the diagram. It here penetrates a very minute opening at the apex of the ovule, ealled the micropyle, and transfers a male nucleus into the egg cell within the ovlue. The male sexual nucleus there unites with the female nucleus of the egg cell and completes the process of fertilization. From this union develops a eell eontaining protoplasm, the nirtogenous living substance of which the most rapidly-growing parts of plants are mainly eomposed. Each little ovule in which this pollination took place gradually develops into an apple seed. The different stages of this seed development are shown in the series of plates Nos. I, III, V and VI.

By experimentation extending through a number of years it has been found that if many of the ovules in the apple flower fail to become fertilized (which of course results in undeveloped seeds) that the apple will either lack size or symmetry, or both. Since this condition is true the fruitgrower should endeavor to furnish conditions which will cause every flower which is to bear fruit to become thoroughly fertilized. To bring about good fertilization, thorough pollination is absolutely necessary. What does this process of pollination mean to the fruitgrower? It means that it is a potent factor, first, in the quantity of production and, second, in the size and shape of the fruit. It is a process in which the flowers and the bees co-operate for each others' good, a process which is often termed symbiosis. It is a process where a member of the plant kingdom has modified its structure for the purpose of reaping a benefit from a member of the animal kingdom (in this case the honey bee) as a pollen distributor and has offered the sweet nectar as a reward. Since the pollination of the apple flowers is performed almost solely by the honey bee it behooves the fruitgrower to have bees in abundance in his orchard. It can only be determined experimentally whether or not the number of bees existing in an orchard is sufficient. The experiment may be performed by the fruitgrower by placing a hive of bees at one end or in one corner of a large orchard and then observing the amount and shape of the fruit set. This method of determining whether bees are in sufficient abundance is of course expensive, for any lack of them results in a shortening of the fruit crop. Hence it is well to insure against the possibility of loss by keeping a few hives of bees distributed through the orchard. Bees not only will often increase the quality and quantity of the fruit but incidentally will furnish the fruitgrower with wax for grafting and with honey for the home.

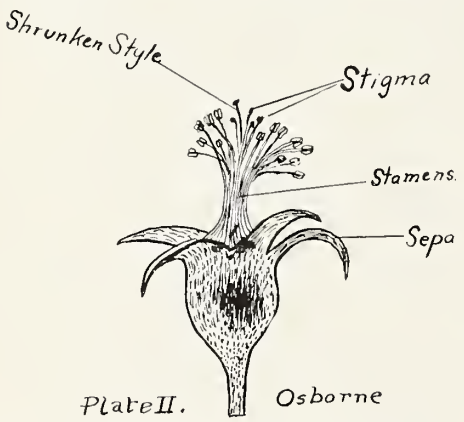

Plate II. Osborne

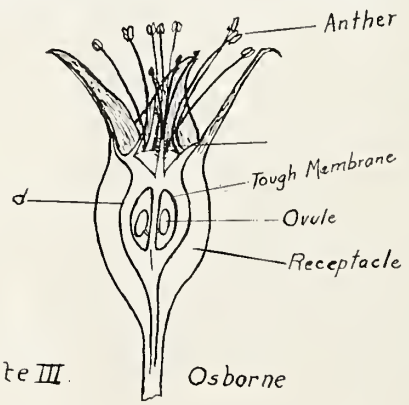

Plate III. Osborne

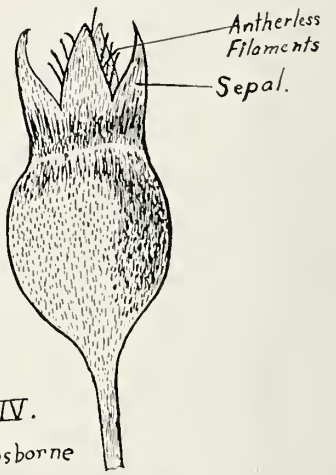

Plate IV. Osborne

While bees are necessary in every orchard to carry on the work of pollination, successful pollination can only occur where the different varieties are set out with reference to the time of blossoming. Only certain varieties of apples will pollinize well together. It is therefore obvious that their time of blossoming must be the same. In order to produce fruit not only should the time of blossoming be

Continued on page 26

NOT AN EXPERIMENT

The Cutler Fruit Grader

Simple, durable, accurate and tested by experience

A double capacity CUTLER GRADER as it now stands in the packing house of the Hood River Apple and Storage Company, after handling over 40,000 boxes last season. Read what they say below.

We ask you as businesslike fruit growers to read and weigh well every word of this advertisement. We not only think the CUTLER GRADER will save you money, but we know it will, because the records of growers using this machine last year prove that this saving ranges between 5 and 7 cents per box. Many of our customers saved the cost of their machines several times over the first season. We not only think it will run successfully without breakdown, but we know it will, because of the experience behind us. A small wrench and a screwdriver are all the tools you need. There are no complicated parts to be repaired while your men stand idle, no springs to weaken, no vibrating parts to jar loose.

Our prinicple is correct for flat, round or long varieties. Every apple is measured cheek to cheek. The accurate sizing almost doubles the output of the packer as proved by a season's averages. Again no guess about this. The fruit is handled gently, no violent action with liabaility of stem punctures or breakage of stems when handling pears. The CUTLER GRADER will handle a large output in a small space, and two grades at once, even with the smallest model. The carrier of this machine could size and deliver over 1500 boxes a day, but the working capacity of anv machine is limited to the volume that can be packed at the bins. This machine has a greater working capacity, size for size, than any other machine on the market. This is chiefly because of the ability to control the delivery of the fruit into the bins, allowing all the packers to get to the fruit even when the variety runs principally to two or three sizes. A machine without this delivery control runs a variety of this kind into a few bins, leaving the other bins useless, cutting down the number of packers that can be used. It takes but a moment's adjustment of the CUTLER GRADER to spread these crowding sizes into adjacent bins. Our small model is admirably suited for the individual grower. It handles two grades (a very necessary feature), is only 16 feet by 7 feet, requires less than ⅛ horsepower, and can be enlarged later by addition of sections.

RESULTS—NOT THEORIES

Note what a few of our many satisfied customers write us AFTER A FULL SEASON'S TRIAL

Hood River, June 20, 1914.

Cutler Fruit Grading Machine Co., Hood River, Oregon.

Gentlemen: Replying to your further inquiry in regard to the grading machine which we bought from you last year, we are pleased to state that it was a splendid success. We experienced no trouble in operating the machine and the exact records of costs which we have kept for several years show your machine saved 5 cents per box. We handled nearly 10,000 boxes in a 30x40 tent, and realize that without your machine to move the fruit quickly we undoubtedly would have lost heavily from bad picking weather. Your method of sorting the fruit, where the sorter inspects each apple as he places it in the carrier, proved very satisfactory to us, and we believe it to be one of the strongest features of your machine where accurate sorting is desired. The machine, we believe, paid for itself several times over the first season and we wish you every success. Yours truly, DICKERSON & PECK, (signed) W. B. Dickerson.

Hood River, Oregon, May 28, 1914.

Cutler Fruit Grading Machine Co., Hood River, Oregon.

Dear Sirs: Replying to your inquiry, I am pleased to state that the machine which you installed in my packing house last fall saved me from 6 to 7 cents per box, and made it possible to handle a much greater quantity of fruit in the packing room than we could in previous years. The two regular packers whom I employed averaged 121 boxes each in 10 hours through the entire season. These same packers, working for me the previous year, did not average over 65 boxes each per day. The machine paid for itself several times over in the one season. Very truly yours, (signed) W. E. SHERMAN, Hood River, Oregon.

May 28, 1914.

Cutler Fruit Grading Machine Co., Hood River, Oregon.

Dear Sirs: We used one of your double capacity Grading Machines last season from October 1st to January 4th, without any loss of time, due to the machine, and packed out over 40,000 boxes. We found that eight men sorting and feeding into the machine brought our daily output up to an average of 800 boxes per day, when running full crew. We believe your machine to be superior to the other makes that we have seen or used. Yours very truly, (signed) THE HOOD RIVER APPLE & STORAGE CO., Per M. M. Hill.

Demand is active and our output is limited, so write before it is too late to

The Cutler Fruit Grading Machine Co., Hood River, Oregon

BETTER FRUIT

HOOD RIVER, OREGON

Official Organ of The Northwest Fruit Growers' Association

A Monthly Illustrated Magazine Published in the Interest of Modern Fruit Growing and Marketing

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California State Fruitgrowers' Convention

By E. H. Shepard.

THIS convention was held at Davis, California, June 1st to 6th, and was the largest and most enthusiastic convention of fruitgrowers I have ever attended. It was held on the Experiment Station Farm at Davis, consisting of 720 acres, which is operated in connection with the University of California. About 200 students are taking courses at the Experiment Farm and are engaged in practical work of general farming of all kinds, that is, the students attend the courses and do the actual work on the farm, and consequently get both the scientific and practical side of the work at the same time. The program was arranged by Professor A. J. Cooke, State Horticultural Commissioner of the State of California. The arrangement of the program and the place of meeting was original and new. Every other fruit convention I have attended has been a continued series of lectures all in one room, covering a period of three days or less. This meeting lasted a week. At every hour in the day there were seven lectures, addresses or talks being given on different subjects, so that every fruitgrower could pick out the particular subjects in which he was most interested.

Among the principal kinds of fruit that were covered were prunes, peaches, apples, plums, pears, cherries, grapes, oranges, lemons and olives. However, addresses were delivered in reference to the production of every kind of fruit that is grown in the State of California. In addition to this there were splendid addresses on the different problems connected with the orchard business, such as control of the codling moth, aphis, red spider, San Jose scale and other insects and pests. A series of addresses were also given on pathological troubles and also a series of lectures on other important matters in connection with the fruit industry, such as pollination, cultivation, pruning, spraying, inter-cropping, wine making, grape culture, fertilization, co-operative farm credits, frost damage, decay of fruit in storage and in transit and other subjects too numerous to mention.

The plan of holding the convention at the Experimental Farm was certainly a success and I believe it would be an excellent idea if state horticultural conventions could be held at agricultural colleges during the vacation periods in the summer or winter. The agricultural colleges furnish just the kind of opportunity that is needed. The various class or lecture rooms could be used for addresses and discussions on different topics, so the prune grower would not be compelled to listen to the talks on apples, in which he is not interested. Such an arrangement would overcome what to me seems the most objectionable feature in the usual arrangement of programs. It would enable the grower to select the subject in which he was most interested and at the same time during every minute of attendance enable him to listen to the subjects or discussions on matters of practical value instead of compelling him to listen to a discussion on some kind of fruit or some matter in which he was not interested. There is nothing that makes a grower tired more quickly than to listen to a long address on something in which he has no particular interest while waiting to hear something else.

The California idea of having a recess of one-half hour in the morning and afternoon gave growers a splendid opportunity for perhaps what is one of the most important parts of the meeting,—the individual discussions with each other about their own practical experiences. A part of the afternoon could be devoted to some general subject in the auditorium in which practically all fruitgrowers would be interested, such as an address on the marketing problem, association work or co-operation and financing. The evening addresses could be broader and consist of a general course of lectures, and could be made entertaining and interesting for the general public as well by having stereoptican lectures on subjects that would be instructive and interesting to all people engaged in farming or living in the country. Such subjects as good roads, rural life, country schools, farm credits, etc., could be discussed.

The ideas I have suggested in this article are not at all original on my part, but are the ideas as carried out in the California Fruitgrowers' Convention, which was most successful and the largest that has ever been held in that state. Over 1,000 fruitgrowers attended this meeting, although it was held at a time when many were engaged in harvesting strawberries, cherries, apricots and peaches.

California is a very large state, in fact so large you could place New York, Ohio, Pennsylvania, Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, Delaware and New Jersey on the map of California and still have space left. The state is very long, being about 800 miles in length, so therefore the summer meeting is generally held in the northern part of the state and the winter meeting in the southern part of the state. The idea of holding the convention at the Experimental Farm, as I have already said, was very practical because, being vacation time, the dormitories were used for guests and bed or room could be secured for fifty cents to one dollar. The large dining room was used and as good a meal as anybody could wish was served for 35 cents. The matter of expense is quite an item with the fruitgrower in attending meetings of this kind, and by holding such a meeting at the colleges the expense while in attendance could be made very much less than in a large city, where fruitgrowers would be compelled to board at a hotel, which would cost considerably more.

In all of our agricultural colleges there are very excellent exhibits and collections of all the different insects, pests and diseases, showing their life history. Arrangements could be made for an hour a day in each of these rooms, in which a number of the professors, assistants and instructors could assemble to explain and instruct the fruitgrower. This is among the most important reasons for suggesting that fruitgrowers' meetings be held at agri-

cultural colleges. It is always more or less difficult to secure speakers for fruitgrowers' conventions on account of the expense in attending, including railroad fare and hotel bills. Usually in the Northwest the speakers are invited to attend and pay their own expenses. In order to secure the ablest speakers, that is the most eminent men in science on diseases and insect pests, I believe in future it is going to be necessary for the fruitgrowers' convention to arrange to reimburse the speakers who address a meeting for their traveling expenses and hotel bills, that is those who attend from outside the state. In all agricultural colleges, in addition to the professors and assistants, there are many instructors and students taking a post-graduate course who could be utilized and furnish the grower with an invaluable fund of scientific information about the life history and development of many diseases and pests. One other feature in connection with the California Fruitgrowers' Convention which impressed me very forcefully was the meeting of all the state horticultural commissioners. In California each county has a horticultural commissioner. Many states have a county inspector, whose position is similar to the county commissioner in California. This conference was of inestimable value to the fruitgrowers of California. Such a conference should be held in other states at fruitgrowers' conventions. One feature of scientific importance was the meetings of plant pathologists and entomologists. While these were too sicentific for the average fruitgrower, still they are of great value to the pathologists and entomologists. Such meetings result in a discussion of many problems which are in the process of solution, each giving his own practical experience and knowledge.

As editor of "Better Fruit" I had the honor to be asked to address the meeting on "The Functions and Problems of the Horticultural Press," and also was requested to give an address on "The Problems of Securing Standardized Apple Packs" and "Fruit Marketing From the Standpoint of the Pacific Northwest." While the program covered practically every field of horticulture endeavor by sicentific and practical men, I regret I cannot speak individually of each of the addresses. In fact this would be impossible, for the reason that usually six or seven addresses were taking place at the same time and I was only able to attend one of them; therefore I shall have to limit my remarks, first, to the addresses which I heard and, secondly, to those which were broadest in their significance.

Among some of the most important subjects upon which talks or addresses were given, with discussions following, were "The Practical Enforcement of the California Horticultural Quarantine Law," by H. P. Stabler of Yuba City, Fred Maskew of San Francisco, Wm. Garden of Stockton and Wm. Wood of Los Angeles; "Our Future Labor Supply and Population," by Simon J. Lubin of Sacramento, one of the pioneer successful merchants of that city; "Some Things That Prospective Settlers Ought to Know" and "Investment Required for the Satisfactory Income," by Dean Hunt of the University of California; "Pollination of Fruit Blossoms," by Professor A. J. Cooke, State Horticultural Commissioner; "Apple Culture in the Watsonville District," "Pruning the Apple" and "The Cost of Spraying," by Professor W. H. Volck, who is connected with the Department of Agriculture and Horticultural Commissioners, located at Watsonville, the biggest apple-producing section in the state. In Watsonville everybody does as Volck says.

Mr. G. Harold Powell, whom everybody knows, manager of the California Citrus Fruitgrowers' Exchange, which handles 50,000 cars annually, and formerly chief executive in the Department of Horticulture at Washington, D. C., gave a very interesting talk on "The Fundamental Principles in Cooperation as Applied to Agriculture" and "The California Fruitgrowers' Exchange."

One subject that probably created in its various phases more interest than any other was, "How Will California Be Affected by the Passing of the Eight-Hour-a-Day Law." Several addresses were given on this subject under various titles by the following people: Geo. Hecke, Woodland; G. W. Pierce,

Davis; Mrs. Emily Hoppin, Woodland; Jas. Mills, Willows, and A. W. Morris, Woodland. The convention was unanimously opposed to the eight-hour-a-day law as applying to the fruit industry. It was the consensus of opinion that such a law would mean millions of dollars of loss. The fruit erop matures quiekly and ripens rapidly. All overripe fruit is practieally a loss. It was the consensus of opinion, at the present time under the present labor conditions, that inasmuch as fruitgrowers have extreme difficulty in getting their crops harvested before they become too ripe that any law that would tend to shorten the present hours would mean an immense loss to the fruitgrower and naturally result in the quantity of fruit being shipped materially lessened, intimately affecting the consuming public and the whole population of the United States by reducing the supply of fresh fruits. Fresh fruits are not only delightful but a wholesome diet, and therefore it would seem the publie ought to be interested in opposing anything that would tend to lessen the supply.

The "Control of Pear Seab" was ably discussed by Professor Ralph E. Smith of Berkley, who also delivered an address on "The Cause and Deeay of Fruit in Transit," eontaining valuable information for the grower.

Professor B. B. Pratt of Berkeley, whom many fruitgrowers of the Northwest will remember, gave a very interesting talk on "Apple Handling and Storage" and "Pre-Cooling and Storage of Pears."

"The Codling Moth and Its Control" came in for a splendid discussion, whieh was indulged in by Professor A. J. Cooke, G. P. Weldon, formerly of Colorado; Dr. E. D. Ball, director of the Experiment Station of Logan, Utah, and others.

Professor L. R. Jones of Madison, Wisconsin, who is regarded by many as the most eminent pathologist in the world, gave a most instructive leeture

on "International State Relations in Plant-Disease Control."

Professor O. B. Whipple of Bozeman, Montana, formerly connected with the Colorado Experimental Station, gave some interesting information in reference to "Frost Damage in Deciduous Orchards."

Professor C. I. Lewis of the Oregon Agricultural College Experiment Station, whose reputation is becoming national as a horticulturist, gave some very interesting lectures on "Pear Culture in the Northwest," "Irrigation of Deciduous Fruit" and "The Loganberry Industry of Oregon."

Professor C. W. Woodward of Berkley, California, gave a very interesting exhibition of nozzle action in spraying, showing a nozzle which is used in spraying elm trees in New England for the brown-tail moth and the gypsy moth, and illustrating the action of the M. A. C. nozzle, which originated at the Massachusetts Agricultural College, and throws a stream of spray in the highest elm trees to a height of perhaps 100 feet or more.

Professor U. P. Hedrick, horticulturist, who is conceded to be one of the most eminent horticulturists in the United States, connected with the Experiment Station at Geneva, New York, gave some extremely interesting lectures on "Improvements of Varieties of Fruit by Bud Selection," "Root Stocks for Trees" and "Fertilizer of Fruit Trees."

One of the most entertaining talks was given by Professor A. D. Shamel, Riverside, on "Citrus Observations in Brazil," which was illustrated by stereoptican views. Many years ago a lady of Southern California visited Brazil, and seeing the navel or seedless oranges made arrangements to have the United States government import some of these trees from Brazil. She succeeded in securing two, which she planted in her back yard, although the rest of the trees which were sent to other places died. The variety was named "The Washington Navel Orange." From these two trees all the other navel oranges in California have been propagated, and this orange today is planted more extensively than any other orange and has proved to be the greatest money maker. Professor Shamel's talks were very interesting, as the stereoptican views showed scenes along the entire trip, with views of the orange groves of Brazil. His remarks were very entertaining and made interesting by many conversations with Colonel Roosevelt, who traveled on the same steamer on his exploring trip to South America.

The red spider mites, which are among the most serious pests, were discussed by Professor H. J. Quayle of Berkley, with instructions as to their control.

Fruitgrowers of California are giving much attention to the economic side of the business, that is, the cost of production. This subject was discussed in various phases by many different speakers, Professor Woodworth giving

a talk on "Estimation on Quantity of Spray Required Per Tree."

Dr. E. D. Ball gave a very interesting lecture illustrated with stereoptican views, on "Irrigation and Drainage in Relation to Permanent Horticulture." Many fruitgrowers of the Northwest will remember Dr. Ball, who has addressed many conventions. Dr. Ball is one of the scientific men whose energy will not permit him to drop his research work until he has arrived at a definite conclusion, and when he has he has the fearlessness to give his convictions without fear or favor. This lecture Dr. Ball illustrated with views showing the damage to orchards by lack of drainage and over irrigation, showing the death of many orchards due to irrigation where alkali was plentiful in the soil.

Mr. C. E. Virden, manager of the California Fruit Distributors, which handles more cars of deciduous fruits than any other concern in California, gave an exceedingly interesting talk upon this subject.

W. S. Ballard, connected with the Department of Horticulture of the United States government, gave one of his characteristic talks on "Control of the Apple Scab and Mildew." Professor Ballard, in connection with Professor W. H. Volck, succeeded in working out the Iron-sulphide treatment for control of powdery mildew, which was the first remedy that was ever discovered that would control this disease. Many fruitgrowers will remember Mr. Ballard, who is one of the most thorough men connectend with the Department of Horticulture of the United States government at the present time. Mr. Ballard is a man who can say much in a very few words, a man who is very careful about what he says, a man who is not afraid to say "I don't know," and a man that you can depend on when he tells you something.

Dean H. E. Van Norman of the Farm School gave a most hearty address of welcome to the convention and is entitled to much credit for the able manner in which he has conducted this practical school of education for the farmers and fruitgrowers of California. Probably no state has a horticultural commission department which is more ably conducted than California, under the direction of Professor A. J. Cooke and his assistants, Mr. Weldon and Mr. Essig, which is supplemented by a county horticultural commissioner in each county of the state.

George C. Roeding, who has probably done more for the fig industry in the State of California than any other man, gave a very interesting discussion on this subject. Mr. Roeding is proprietor of the Fancher Creek Nurseries and has nurseries in several other sections of the state. While Mr. Roeding has made a fortune out of the nursery business, he has been a liberal spender all his life in helping to develop the fruit industry of the State of California.

One of the most original lectures was on the "Compatibility of Spray Mixtures," by G. P. Gray of Berkley, which was illustrated by a table showing results by combining different spray mixtures, in which he has five classifications: The first showing where better results were obtained by the mixtures; second, where chemical properties were not changed by the mixtures; third, where the mixture was efficient and not injurious; fourth, where it is inefficient and not injurious, and fifth, where dangerous.

While ordinarily subjects discussed by conventions do not make very in-

teresting reading matter, I feel this convention and the subjects handled are so valuable in affording suggestions for other conventions that I feel justified in treating this subject in rather a lengthy way, and I confess I have taken particular interest in doing so because I graduated from the University of California in 1880, and the great fruit industry of the State of California is largely responsible to the University Experiment Station for the advice and instructions it has given. I trust the many very interesting speakers whose addresses or names have not been mentioned in this article, as our space is limited, will kindly pardon me for the omission, because I have confined myself principally to the kinds of fruit which are grown throughout the United States in general and the Northwest in particular, where "Better Fruit" has the largest part of its circulation. I beg the pardon of all the speakers upon citrus subjects for lack of mention of them individually, and in explanation would say that such subjects would only be interesting in California, where the citrus fruits can be grown; and, furthermore, I hardlly feel able to make any comment on addresses on citrus fruits, for the reason I have no knowledge of this branch of horticulture. In conclusion I want to say that the canned-fruit output of California is the largest industry of the state.

Obituary

Clarence M. Stark passed to his reward on Saturday, May 30, at his home in Louisiana, Missouri. Born in 1855, Mr. Stark spent practically his entire life in orchard and nursery work, and for many years prior to 1903, when he retired from active business, he was the president of Stark Bro's Nurseries and Orchards Company of Louisiana, Missouri, which business owes the greater part of its success and enlargement to his sagacious management. It was he who named and gave to the world the Delicious apple, and the introduction of many other valuable varieties is due to his untiring efforts. In his demise horticulture has lost a willing worker, the world an able pomologist, and the Stark family a tender, loving father and brother.

The Setting and Dropping of Fruit

[Circular of New York Agricultural Experiment Station]

ONE of the discouragements in fruit growing is the uncertainty which attends the formation and development of fruit buds. Failure to set fruit, even though the trees bear an abundance of blossoms, the dropping of immature fruits, the biennial bearing habit of certain apples, and unfavorable weather at blooming time are common and seemingly unpreventable drawbacks to profitable fruit growing. The biblical injunction "to dig about and dung the trees" may be obeyed both literally and figuratively, and yet the trees may fail to blossom, or to set a crop, or the fruit drops, or wind, rain, cold or frost may destroy the embryonic fruits. Indeed, seemingly, the better the culture, the greater the retrogression in sexual reproduction, and the forces set in motion by the cultivator in no way nullify the effects of bad weather. Roughly, these problems fall under two heads: First, those having to do with the formation of fruit buds; second, those having to do with the development of the buds.

Can the fruit grower influence the formation of buds? Though he cannot wholly control the formation of buds, he can at least greatly influence their formation. We may lay down as the first principle having to do with the formation of fruit buds one founded on the experience of fruit growers with practically every fruit: that plants develop fruit buds only where there is a store of food materials in twigs and branches. Another statement to much the same effect is that plants will not form fruit buds when the food material is being largely used in the production of new wood and new leaves. Many facts and horticultural practices substantiate the statements just made. Thus, trees unduly luxuriant in growth do not set fruit; plants without sufficient food for both wood and fruit bearing do not as a rule produce fruit; in warm, damp climates trees and vines grow to great size and with much foliage, but bear little or no fruit; pruning, which is favorable to wood growth, is antagonistic to fruit production. Plants that are producing too much wood and foliage and too little fruit may be subjected to several treatments to induce them to bear fruit.

Regulation of the water supply sometimes induces the formation of fruit buds. In the irrigated regions of the West vegetative growth may be stopped by withholding water and the setting of fruit buds thus be materially influenced. It is a matter of common observation everywhere that a dry season is more conducive to the formation of fruit buds for the ensuing season's crop than a wet one. The water supply in unirrigated regions may be regulated only through drainage, but fortunately drainage may often be made an important means of inducing early fruitfulness and a fruit-bearing habit. Other things being equal, trees on wet, sodden soils do not bear fruit early in life and do not set fruit regularly and in proper quantities. Under such conditions there is insufficient food for either wood or fruit production. The remedy is obvious and the subject needs no further discussion.

Much can be done in securing the proper formation of fruit buds by giving the trees an abundance of light. The outside row in an orchard, where the trees have most light, usually bears the most fruit. It is true that these isolated trees have more food and moisture as well as more light, and because of these two factors, also, many buds set. Yet light must be counted as important, and is to be secured by proper spacing and by developing open-headed, well-pruned trees.

The food supply has much to do with the formation of fruit buds, and probably the most rational procedure under average orchard conditions to induce fruit bearing is to regulate the supply of food. With the widely varying conditions of different orchards, this is not

easily done. It does not appear from any information that we now have that there is a storage of particular food for fruit buds and of other food for wood growth, but rather that stored food is quite as available for one sort of growth as for the other, yet it is generally supposed that the kind of food given plants influences the amount stored, and, consequently, the number of fruit buds formed or the amount of growth made. Briefly, the behavior of foods upon manner of plant growth is supposed to be this: An abundance of food, especially if it contains nitrogen, and if at the same time there be a plentiful supply of water, is most favorable to the formation and growth of cells, hence of wood and leaf growth. If the amount of food be decreased, and more particularly if the nitrogen as compared with the potash and phosphate be decreased, and especially if there be an increase of light and air, wood growth is lessened and the number of fruit buds is materially increased. Sometimes the excess of food and moisture is already in the soil, and the problem then is to reduce the quantities and so bring on fruit-bud formation. The orthodox method of reducing the quantity of plant food and soil moisture is to sow a grain crop in the orchard. The trees under such treatment cease to make wood growth and use the assimilated substances in the making of fruit buds. This procedure, it should be said at once, is seldom necessary. The fact that leaf and wood growth and fruit bearing in plants are opposed to each other is well recognized by fruit growers; but the knowledge is quite too often wrongly used, exemplifying again that "a little learning is a dangerous thing." Thus, to bring trees into bearing is often the owner's excuse for double-cropping orchards, putting an orchard down to sod and withholding proper cultivation.

Pruning often materially aids in causing the storing of plant food for the formation of fruit buds. One of the general aims of pruning is to regulate the crop of fruit by removing parts of the plant, that those remaining may store the necessary food. The theory of pruning to cause formation of fruit buds is simple, but the practice is not so simple. The effects of pruning are so varied under different conditions that it is exceedingly difficult to give directions as to its use in influencing the setting of buds. Heading-in may sometimes be used to advantage in pruning for fruit. It consists in cutting back young, unbranching shoots which set few or no fruit buds. Heading-in is a necessity with dwarf trees. Practice differs as to whether the operation should be performed in summer or

winter, but it is usually performed in summer and is then spoken of as summer pruning. Heading-in greatly thickens the top, thereby excluding light, and must be practiced very judiciously, or more harm than good is done. Summer pruning is rather commonly used to influence the formation of fruit buds for the succeeding season. The theory is that by removing a part of the young shoots of the current season, we take from the trees the portions which are making the greatest demands on the plant's nutritive powers and that the remaining part of the shoots with their buds are enabled to store up greater quantities of reserve food than they otherwise could. This summer heading-in should be done before growth ceases. So much, however, depends upon several varying factors that no fixed rule can be given as to time; thus, much depends upon the fruit, the varieties, soil, climate, weather and the amount of growth. Summer pruning is a weakening process and may permanently injure a tree in our climate. With standard trees it is only of advantage in moderation in eastern North America and as usually practiced more often results in evil than in good. Summer pruning is of more value in the early life of the tree than later on. Summer pruning as a means of inducing fruitfulness is greatly overestimated under American conditions and belongs more properly to the elaborate systems of pruning and training practiced by Europeans.

Continued in next issue

Development of the Apple, Etc.

Continued from page 16

the same but the flowers of any one variety must be capable of either being fertilized by their own pollen or by the pollen of some closely-related variety. We thus have those that are termed self-fertile (fertile to their own pollen) and those that are termed self-sterile (sterile to their own pollen). There are also varieties which are only partially self-sterile. Due perhaps to environmental conditions, the class to which any one variety of apples belongs varies in different localities. Not

only do the environmental conditions represented by climate and soil determine the class to which any variety of apples belongs but they even determine the quantity of pollen produced. Hence it becomes of especial scientific interest to us when we consider that these environmental factors influence the characteristics and behavior of the germ cell of the plant. By writing to your state experiment station you can usually obtain a list of the apples which pollinize well together and of those that blossom at the same time. Such a list becomes very valuable for reference at the time of planting an orchard.

Let us consider the changes in the fertilized flower after the petals have fallen and their relation to orchard spraying. By examining plates Nos. II and III it will be seen that the changes that are evident in the remainder of the flower are shown in the way of a shrunken style and stigma, in the open and empty anther sacs which contained the pollen and in the somewhat larger receptacle. Now let us examine

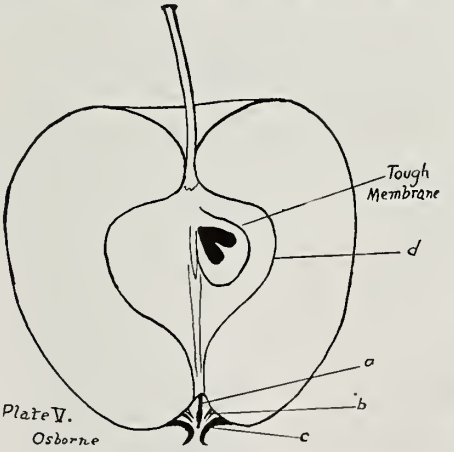
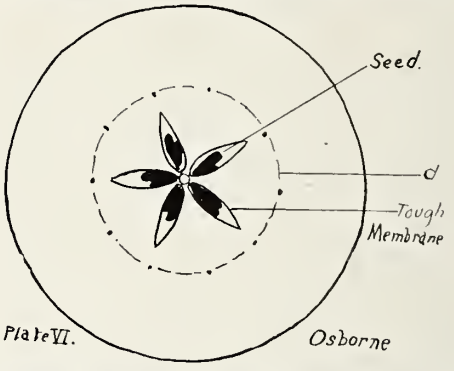


plate No. IV. In this we find that the sepals are turning inward, due to the enlargement of that part of the original flower in plate No. I, termed the receptacle. It is the receptacle of the flower which develops into the edible portion of the apple as shown in plate No. II, and the corresponding parts in plates Nos. V and VI.

Our rules for spraying for the codling moth tell us that the first spraying should take place immediately after the petals fall and that the calyx (the sepals taken together constitute the

calyx) should be well filled with the poison. From an examination of the plate No. IV it can readily be seen that the turning in of the sepals as the little apple develops from the flower directs a spray away from the calyx cavity. A few days later in its development the sepals form a sort of a cone-like roof over the calyx cavity much like that of a mature apple, as shown at "c" in plate No. V. It can also be seen by a close examination of plate No. II that the larva of a newly-hatched moth has but a small distance to eat to reach the center of the little apple during the early stages of its growth. It is also noticeable that the calyx cavity during the early stages is quite pointed, hence if the poison is well placed during spraying the larva is sure to eat it in its endeavor to reach the inside of the apple. Thus we find that each part of the flower after unfolding from the bud gradually passes through natural changes in developing into the apple.



These changes not only have a highly complex and interesting biological significance from the standpoint of the lovers of nature but also have a practical relationship to the management of the orchard, and to the quantity and quality of the fruit produced.

(TELEGRAM)

Spokane, Wash., June 27, 1914.

E. H. Shepard,

Editor "Better Fruit":

La Salle advertisement in your June issue stating that By-products committee had endorsed his dehydrator is absolutely unwarranted. Neither this committee nor any of its subcommittees has endorsed any processing method. Please give prominence to this statement.

(Signed)

Sixth National Apple Show
By-products Committee.

Standardization of the Prune

Professor C. I. Lewis, Oregon Agricultural College, before Oregon State Horticultural Meeting, December 11, 1913

QUITE a number in this audience were present at Salem on July 3 when I gave an address on the "Standardization of the Prune." That address has also been printed in some publications, so I do not deem it necessary at this time to repeat much of the address that I gave at Salem. However, I want to firmly impress upon you this afternoon the importance of standardization. The mercantile trade and the business trade as a whole realized long ago that it was impossible to do business without standardization. Practically all the manufactured products in this country or abroad have been standardized.

I was very much interested while at Washington to hear an address concerning European co-operation. During this address the speaker referred to the success of the Danish bacon producers and made this statement, that he believed that it was not so much the co-operation alone that was responsible for the great success of the Danish bacon producers as was the fact that they had standardized their product. When an English merchant asked this week for three hundred pounds of bacon he knew a month from now he could get a consignment of bacon exactly like the consignment he received this week. The hogs have been standardized, the business has been standardized. This is what you need to do with the prune. We have a lack of standardization, not only in the product we turn out but in our methods of procedure in obtaining this product.

This refers to the grower, the evaporator and the processor of our product. I do not believe it is wise or that it will profit us in any way to dwell on the troubles of the past. It is indeed hard to fix the responsibility for any shortcomings that the prune business has had to overcome. The growers are very prone to blame the packers and the packers in turn to blame the growers. Perhaps an investigation would show that both were to blame to a certain extent. However, be that as it may, this condition is true today, that the packers and growers, and in general all who are connected with the handling of the prune, seem desirous to co-operate, to get together, so to speak, and forget the past. When any set of men are willing to meet us half way on a question such as this it is indeed wise that we accept their invitation and start with a clean slate.

One of the greatest needs of the prune business of the Northwest is a first-class tart prune. The French prune of California fills to a very nice degree the demand for sweet prunes. However, there is a large class of people who prefer a tart prune. Our Italian prune is not an ideal tart prune. The word "Italian" is too broad; it has been made to cover many strains of fruit, and I am of the opinion that there are a number of varieties of prunes grown in Oregon that are called "Italian" which are really not. The present Italian type is too late in maturing. It is also often too tart and has too thick a skin in many cases. I desire very much to have the hearty

co-operation of all the prune growers of the Northwest in trying to select a new prune. If in your orchards you have certain trees that are better than the rest, if you have certain trees that seem to give you a better product as regards yield, quality, drying characteristics, etc., we would like to come in touch with you and have an opportunity of studying the product from such trees. By all working together we will be able to accomplish a great deal. Already this past year we have found a number of promising prunes in various parts of the state. One question which comes at once to our minds in considering standardization is, "What standards can we establish?"

Will it be a field standard? We who have had experience with prunes know that there are certain prunes which drop on the ground, others have to be shaken from the trees, and others even actually have to be pulled from the trees by hand. A very careful study of the condition of these different grades should be made to ascertain whether or not there is any standard that we can make, any grading at this time. Can we make grades established on such a basis as difference of specific gravities? This, while sounding impracticable, may prove to be quite practicable. Can we make a standard similar to that which the grape growers of California have adopted, namely, one of sugar content? They have a rule that certain varieties of grapes must not fall below a certain sugar test, a certain sugar content. Is it possible in any way to do a grading in the dryers before our evaporation starts? Or, if these things are impossible, can we make grades as soon as the fruit has been evaporated and before it has been processed? Can we eliminate the use of lye? At least it would seem we should come to some common understanding on this question. What are some of the changes the prune passes through in evaporation? Are our present methods of processing the best? These are some of the questions that we can well ask ourselves, some of the questions that we need to think about very seriously; and some of these questions will need much careful investigation before they can be intelligently answered. I must call your attention to the fact that we are not alone in the investigation of the standardization of the prune. The prune growers of Southern Austria and Servia have started an investigation of this very question, and if they should beat us in the investigation and be able to standardize their product before we can standardize ours, they will crowd us in certain markets.

From the study I have been able to make of this problem, it seems to me that a certain definite program should be laid out and followed. It will be necessary for the experiment station to first conduct a series of investigations before we can answer many of these questions. Second, as fast as the investigations produce results there should be a campaign of education among the people interested in prune production.

An inspection of the prune dryers can follow very successfully the campaign of investigation and education. As soon as the people come to realize the importance of this work they will welcome any inspection which will aid us in getting better production. A series of meetings will be necessary before next season before we really accomplish results, such as the meeting at Salem last year.

The part the agricultural experiment station is playing in this program will interest you. The departments of chemistry, plant pathology, entomology and horticulture are all working on problems that will assist the prune men. In the department of horticulture we are starting some plant-breeding work. We are working out the pollination this year of the prune and are hoping as a result to be able to make some selections and crosses which may enable us to secure a better prune than we now have. We are conducting fertilizer experiments on some of our prune orchards to determine whether or not the addition of certain plant foods will be desirable. We have also started our first year's investigations in the possibility of standardization. We do not care to say very much about our first year's work, although we are somewhat encouraged. We feel this work should be checked over carefully for a number of seasons before we can consistently take a definite stand. We have started a study of this problem from the field to the packed box. The fruit has been studied in its different natural groups in the field. We have found that with this fruit there is a great difference in specific gravities between those which drop naturally and those which have to be shaken from the tree. In fact, there is such a difference that there is some promise that by means of a determination of differences in specific gravities we may be able to establish certain grades; and that certain qualities, such as maturity, sugar content, general eating and drying qualities are very closely associated with this difference in specific gravity. We have also come to the conclusion that the use of lye is not only undesirable but unnecessary. There has been a feeling among the American people, and among certain experts of the Department of Agriculture, that the use of such substances as lye and sulphur is unnecessary in connection with the drying of fruits, and the feeling is that the various substances used are not so much for the purpose of simplifying methods of evaporation or to enable the grower to turn out a better product, but on the contrary to allow him to use certain fruits and vegetables which are undesirable for foods, and that the use of such chemicals can cover a multitude of sins. Whether or not this contention is true is not for me to say, or to discuss at this time. The fact remains that many people believe this to be the case, and many people both in this country and abroad are demanding that such substances be not used. This feeling is so widespread that investigations have been started in various ways

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and considerable publicity has been given to certain findings or certain opinions. This publicity is generally rather undesirable on the part of the produeer. We have found this past year that the use of boiling hot water can be made to take the place of lye, and if anything that the general appearance of the prunes when they are dipped into boiling hot water is superior to that where they are dipped in the lye. As far as the evaporation is concerned, we feel that we can say very little.

We doubt if the ideal evaporator has yet been built. The various types which we have, undoubtedly have much merit, and by close study of these different types we will be able to combine certain characteristics in one dryer which should be superior to anything that we now have. One great fault with the present dryers is that they are not efficient. There is a tendency for the man who runs the dryer to try and utilize all the heat which comes through the tunnels or stacks. He leads this heat so far that he really loses much heat, and in trying to conduct it so far the efficiency of the heat is greatly lowered. We have made a careful study of temperatures, ventilation, etc., and we feel that by another year we will be able to give you something quite deflnite along these lines. In regard to processing, will say that we have tried this year two different methods of processing and since we have followed the fruit from the tray to the box we will be able to know which of these systems seems to have the most merit.

In addition to the work we are doing in the department of horticulture, other departments mentioned are doing some experimental work. The department of chemistry is co-operating with the department of horticulture in this study of prune standardization, making whatever chemical analyses are desired. The department of plant pathology is working on the molds and rots which occur on the prune, and the department of entomology will work on the problem of certain worms and mites which are known to attack the fruit under certain conditions. It is going to take, however, a number of years before we can make much progress and we hope the growers meanwhile will be patient and co-operate in every way possible. It is only by hearty co-operation, by all of us working together, that we can hope in the near future to really standardize the prune.

Production of the Walnut in the Northwest

By Ferd Groner, Hillsdale, Oregon

AS the walnut industry is comparatively new in the Northwest, the question has been often asked, "What income can we expect per tree or per acre from orchards at different ages, and what it costs to bring an orchard up to a paying basis?" Last year a paper read before the Oregon State Horticultural Society on the question of cost and production seemed to me so pessimistic that I set myself about to gather figures on cost and actual returns. The question of how many trees to the acre has been argued considerably, and we find orchards planted all the way from thirty to sixty feet apart, some with fillers of peaches, prunes or cherries and some without.

After years of study I favor planting forty feet square without fillers, if financial returns are to be considered. I will not go into detail in regard to price of land or machinery, as it would vary greatly in different localities, but the cost of first-class trees set in the ground, counting plowing and preparation of the soil, should not exceed $45 per acre. In my six years of experience in intercropping between the trees I have made careful estimates of what it will cost to bring an orchard up to the bearing age, and have raised kale, corn, rape, potatoes, peas, vetches mixed with oats, and wheat and pumpkins. If the trees are staked, hogs do very little or no damage to the young trees, and I often have a large herd pasturing on the rape or vetches while feeding pumpkins or cull potatoes. By cultivating clean during spring and summer from one-third to one-half of the ground along the trees, according to age, the other one-half or two-thirds can be made to pay the whole cost of cultivation. While I do not wish to take time to go into this question in detail, as it would take too long, I do not hesitate to say that I can show figures leaving a safe net return, above cost of cultivation and training.

In regard to production per acre, much depends on the number of trees that are planted. An orchard planted thirty feet apart might be profitable at ten or eleven years old, while one planted sixty feet apart may be still an expense, as one would have four times as many trees as the other, and this close or wide planting must be taken into consideration, if you do not want to wait long for net returns. As the trees grow older the difference between the close and wide planting will gradually grow less, and possibly would be about the same at twenty-five years. We have no grafted orchards in the Northwest old enough to estimate from, and only a few in California that we can get some idea from. But we have quite a number of topworked large trees that are showing their bearing qualities. Among these trees are the Franquette, Mayette, Meylan, Glady and Payne. The Franquette, Meylan and Glady bear about alike in quantity. The Franquette seems to be by far the best on account of the uniformity of its large, fine nuts. The Meylan is a fine looking nut and of excellent quality, but has the fault of having too many small ones when the trees are heavily loaded. The Payne blooms too early in the Northwest. While the Mayette scions were secured from different sources, they are all of true type, but have not yielded up to our expectations.

A seedling Mayette in the orchard of B. N. Sturgis at Vancouver, Washington,

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planted at five years old seven years ago, bore eighty pounds of true type nuts of fine quality and fair size this season. Quite a number of the larger Franquette trees topworked from four to six years have produced crops of from 50 to 125 pounds. The following returns are gathered from three of about the oldest orchards in the Northwest: Mr. Turpening of Eugene has five acres of seedlings of different varieties sixteen or seventeen years old; there are many blanks in the orchard where trees had been taken out or died and several that were not bearing, but there were many good trees, some producing close to 200 pounds. I visited this orchard last fall and the owner said it had averaged over $100 net per acre for the last three years and that it would do as well or better this year.

Mr. Thomas Prince of Dundee owns the largest bearing orchard in the Northwest—about 100 acres, I think. I have visited it many times during the last eight years, and have watched its growth and increase in bearing. Some of the trees are forty feet apart, but most of them are thirty-six feet, planted in a prune orchard in the place of every fourth tree. This being a seedling orchard, there is a wide variation in the production of different trees, some not bearing at all, and others only a few nuts, and still others small or poor nuts; yet there are a great many fine trees bearing heavy crops; quite a number this year bearing more than 100 pounds. A few of these trees, I think, are seventeen years old, while some are planted only a few years. Mr. Prince stated to me that as near as he could estimate they would average about thirteen years old. The crop this year, as near as he could estimate, was about thirty pounds per tree, and sold at an average price of 17½ cents. The prune trees are yet growing in a large part of this orchard. The walnut trees are not doing nearly as well in this part, as they are badly crowded, but Mr. Prince says it takes a good deal of nerve to grub out a prune tree with prunes at present prices. Even with all these drawbacks, the gross income from walnuts is not less than $175 per acre. The total cost of cultivation, harvesting and drying should not be over $50 per acre, leaving a net income of $125. If the income from the prunes was added to this it would make an eight per cent dividend on a considerably higher valuation than any of us have estimated at that age.

Mr. B. Norman Sturgis of Vancouver, Washington, has a seedling orchard of fifty-five trees of an average age of seventeen years, the oldest being nineteen years, planted thirty feet apart, making one and one-half acres. The crop last year was gathered and weighed both green and dry. The best tree produced 227 pounds of dry nuts, and they averaged 68⅕ pounds, making a total of 3,700 pounds. These returns are far better than I ever estimated. This orchard was brought up to this produc-

tion by taking out any tree that did not come up to the owner's ideal and planting another in its place. In some places three trees have been planted.

One of three trees in a yard in the suburbs of Brownsville, now twenty-three years old, has produced an average of 150 pounds annually for the last seven years. I have visited the tree many times during the last five years and believe it is the heaviest bearing tree in Oregon. This tree is of unknown origin, it has a very plump kernel and thin shell, but it is not well sealed, and for the latter reason its marketable qualities have been questioned.

Mr. J. F. Bugess, superintendent of the Vrooman orchard at Santa Rosa, California, of about 1,000 trees, states that it is sixteen years old next February, and that it has average forty-five pounds per tree for the last four years. This is the mother orchard of all our Vrooman Franquette.

Mr. George C. Payne, near San Jose, California, has a tree that he topworked about twenty-two years ago, at the age of sixteen years. The last five years it has averaged between 400 and 500 pounds, the highest amount being 714 pounds, that sold for $99.98. There would be room for about six such trees on an acre.

I have considerable data on production in Southern California, France and Italy, but as we are not interested in those countries it would be a waste of time to give it here. A comparison between seedling and grafted trees of the Santa Barbara soft shell variety near Whittier, California, on the farm of a Mr. Scott, may, however, be worthy of consideration. The seedling orchard at twelve years old produced $96 gross, the nuts selling at 14 cents per pound, and the grafted orchard at nine years produced $202 gross, the nuts selling at 16½ cents per pound. While this difference seems too great to believe, it is nevertheless a fact we cannot get away from.

The price of walnuts has nearly tripled in the last twenty years, without any prospect of a decrease in the near future, as the planting is not keeping pace with the increased consumption. The main reason for this seems to be the high price of good reliable trees and the wait of eight or ten years before such returns can be expected. Blight has done more or less damage to the walnut crop, but the net loss to the grower is not as much as is often estimated, for as the crop is reduced, the price is advanced in proportion. In conclusion will say that the production of the orchards here submitted is higher than my most sanguine expectations. These figures would indicate that large areas of Southwestern Washington and Western Oregon, between the Cascade and Coast Range Mountains, will produce as many and as high quality walnuts as any district or country in the world.

Handling of Fresh Fruit

By Peter M. Behr, Trade Manager Steinhardt & Kelly, New York

ONLY a short time ago traffic departments in connection with commercial interests were practically unknown and both shippers and receivers were at the mercy of the carriers, until the "Act to Regulate Commerce" was enforced. Circumstances, conditions, developments and experiences, which have often been placed on the shoulders of the public, at a great financial loss, have satisfied the individual merchant as well as the directors of our numerous manufacturing concerns and corporations that the services of a traffic manager were imperative in handling the traffic of the particular industry in which they were interested. As a result we find today that all up-to-date and progressive firms have acquired the services of competent men, who by their experience are in position to shoulder all responsibility pertaining to the transportation of their respective commodities, from point of origin to destination, with the utmost dispatch. It is also the duty of these men to keep accurate records of the actual condition of shipments on arrival, to place them in position to substantiate any claims which might be necessary to file account of loss, damage or delay, this being essential under the rulings of the Interstate Commerce Commission, and in the absence of which no carrier is permitted to make an adjustment without making themselves as well as claimants liable to severe punishment, as specified in the act. The necessity of a traffic department for the producers, distributors and receivers of fresh fruits and other perishable commodities is so pronounced as to need no comment.

Once again the Northwest has defended its reputation to be far in advance of the East, when the individual producers of the well-known varieties of Western fruits combined into organizations, realizing that only through such concerted and co-operative action could they obtain the very best results and have their products attain the height of perfection, by carefully studied conditions of their crops and consistent and carefully planned marketing systems employed by the various associations. In this their success has been wonderful, as at the present time you can travel almost any part of the civilized world, land or sea, and at your pleasure have the products of our Northwestern friends brought before you to enjoy to your heart's content. The producers, through the associations, make known their desires to prospective buyers, and after sales have been made the associations take full control of the products until they have obtained a bill lading contract from the carriers to deliver a certain car at a certain point, under certain conditions, all of which are covered by tariffs on file and approved by the Interstate Commerce Commission.

Full routing, icing and other necessary instructions are furnished the

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initial carrier by the receiver, if he be an f.o.b. cash purchaser, through the associations, and thus by this endless chain of co-operation the producers, associations, carriers and receivers are brought in very close contact, although actually thousands of miles apart. As Messrs. Steinhardt & Kelly are strictly f.o.b. cash purchasers, the responsibility of delivery at the designated destination of the fruits in good condition within a reasonable time is transferred automatically to the traffic department immediately after the bill-lading contract has been signed by the authorized representative of the initial line. It is needless to say that the men in this department must be wide awake and up to the minute at all times, as many unforseen and unexpected conditions will arise which require immediate, decisive and definite action. While cars are in transit this department must be in position to tell almost hourly where a certain car is at that time, and must be ready on a second's notice to jump into the breach and be prepared, on account of certain conditions and difficulties, which arise at times without notice, to divert a certain car to another market, another to be lightered to steamship pier for export and still another to cold storage warehouse, there to be held for future needs and to avoid glutting the market, which would result in an enormous financial loss. When cars are finally delivered at their ultimate destinations, whether diverted or held under the storage-in-transit privilege, freight bills must be absolutely correct, whether the amounts specified represent the actual transportation, refrigeration, storage-in-transit, switching, detention, car service or diversion charges, before they can be passed to the accounting department for payment. When this has been accomplished the history of the respective shipments pass into oblivion.

Fruit Growing in Tasmania

I have been reading with great pleasure what you have been telling us about fruit growing in your country, and as I cannot talk in your conferences your people might like to read about fruit growing in these new lands where already fruit is eaten in very much larger quantities than we remember in the old world, and where it is produced so easily and so beautifully. Our long sunny summers, extending from October to the following June, mature fruits which never ripen on the tree in the old world. Your Jonathan apple is looked upon as quite an early apple here and produces mature red fruit early in our season. Maidens Blush and King of Tompkins are even

earlier. It is not uncommon for us to gather Josephine pears ripe from the tree.

I would like to take you through my orchards of pears and apples just now, before we gather for England. My specialty is pears, of which I grow some seventy varieties on 5,000 trees. I could show you over 1,000 bushels on the measured acre. The trees are 15 feet apart, or 193 to the acre. Last year they turned off an average over three acres of ten bushels a tree, and now they are perhaps as good. The land is light sand with heavy clay sub-soil, and cost me, uncleared, one pound (five dollars) an acre. Cultivation is carried on through a great part of the year and manuring with farmyard and artificial manures, given about every third year, Pruning in winter is necessary to procure large fruit, each branch of the tree being deprived of all its laterals so as to make it like a cordon, and the tree is kept down to about eight or ten feet high. Winter spraying with lime and sulphur and summer spraying for moth and scab cannot be neglected, for which we use power pumps.

I see some of your speakers challenge the world for their Doyenne du Comice pears, but I would like to break a lance with them. Last year mine sold for a shilling (25 cents) per fruit in Covent Garden Market, and some of my Comice trees turned off five or six bushels. I, too, hold a medal from the London Royal Horticultural Society for my pears, although they had to travel 12,000 miles before being placed on exhibition. Anjous, which do so well with you, are not a great success here, but Glou Morceau, the Covent Garden favorite, does splendily and reaches £2 ($10.00) a bushel in Covent Garden.

In comparison with your prices orchards are sold here very cheaply—first-class orchards ten or twelve years old are sold for £100 ($500) an acre, and any amount of the finest fruit-growing land, as bush, can be taken up from the government at 10 shillings ($2.50) an acre. Southern Tasmania is very montainous and we like to put our orchards in sheltered valleys, where wind cannot blow down the fruit and where we can irrigate if necessary; but our rainfall is so constant that as a rule irrigation is not necessary. This season is very dry, still I have a Bartlett pear before me as I write which measures twelve inches in circumference and weighs seventeen ounces. This is an exceptionally large Bartlett for us to grow, so much so that those I showed it to thought it was a Beurre Deil, which often grows larger than this with us, whilst Comice grows nearly as large. I think some of your Hood River apples came here about Christmas and were greatly admired for their beauty, but the general verdict on, say a Jonathan, was that ours were superior in flavor. Australia and Tasmania expect to send a million bushel cases to Covent Garden this season. Yours truly, H. Benjafield, Moonah, Tasmania.

The Four-Cup Price Fruit Sizer

MADE IN THE FOLLOWING SIZES:

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The 4-cup, as shown in illustration, handling two grades, with a capacity of 1,500 boxes in ten hours.
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Mr. W. G. Price, the inventor of this machine, has had over one hundred patents issued to him; he has been with the government corps of expert army engineers and other highly specialized industries for years. He is a mathematician, engineer and scholar. We tell you this so that you may know that this machine is not the product of a dreamer, or of one unskilled.

NOW THEN

Our Motto: To reduce the cost of putting fruit in the box, so that even a child could do the work and obtain the perfect pack. This machine will save you from three to five cents on every box of apples that you pack; enable you to get a perfect pack, and have every apple in the box the same size; enable you to get the proper bulge, tightness, and do away with over tight and too loose packs; the only machine on the market that does away entirely with expert packers; enables expert packers to double their output and to do better work. The apples are in full view in the bins, so that you can check up your help as to sorting and grading at all times, which you cannot do when apples are sorted from box to box. The only machine on the market that sizes your apples into the twenty Northwest standard packs, and will handle two grades at the same time, doing away with 80% of your crop at one handling, and has a capacity of 1500 boxes per day. It will handle apples, pears, peaches, oranges, onions, potatoes or any other fruit or vegetable that needs to be sized. It will handle fruit as delicately as a woman's touch. **We are demonstrating with eggs to prove its non-bruising qualities.**

Five thousand boxes will save you the price of the big machine the first season, and give you a better pack than you have ever been able to put up before. Twenty-five hundred boxes will save you the price of the medium machine. This Sizer is made in units, so that they can be added to at any time. Write us for further information, and we will cheerfully send illustrations, testimonials and more detailed explanations, and please mention "Better Fruit."

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4. It furnishes the grower with personal representatives in every important market center in America and Europe, and, in fact, the world, whose first consideration is the grower's interests,—who examine the fruit in transit, repair damages, and, where necessary, protect the grower against improper demands for allowances, etc.
5. It secures a uniform and dependable grade and pack of the fruit throughout every district,—a thing of great value to the trade and therefore to the grower seeking the trade,—and it is thereby enabled to back the brand of each district with a guarantee that will bring a higher price for the fruit than for other fruit outside of such brand.
6. It properly and scientifically advertises the grower's fruit, and returns the full value of that advertising to the grower.
7. It gives the grower the power, backed by the exclusive service of skilled legal, traffic and claim departments, to secure justice and fair dealing in all instances from buyers, railroads, etc.
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11. It determines the price at which the grower's fruit is to be sold, just as every other substantial producing business considers cost, adds a reasonable profit, and thus determines the selling price.
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13. It eliminates, by reason of its magnitude, waste in marketing the grower's fruit, and so reduces the price to the consumer, proportionately increasing the consumption of that fruit.
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15. It builds a permanent selling machine for the grower, in contrast to a one-man selling organization, efficient only while the man of strong capacity at its head lives and retains his position,—big enough to handle tonnage ten times as great as in 1912, when every known marketing agency failed, and one that will always be on the job.
16. It investigates and aids in matters of vital importance to the grower, such as national and state legislation, Panama Canal shipping facilities, freight rates, provisions for refrigeration, storage, warehouses, supplies, etc.
17. It puts the grower in business for himself on a business basis.

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